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SYPHILIS

THE GREAT MASQUERADER*

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While, for several hundreds of years, syphilis has been known as one of the most dangerous of the infectious diseases of human beings, yet the cause was not discovered until 1905, or about forty years ago, by Schaudinn, who found that it was due to a microorganism now known as *Treponema pallidum* or *Spirochaeta pallida*. About a year later Wassermann and his colleagues discovered a blood test for the disease which, after undergoing improvements and modifications in technic, is now universally employed as an extremely valuable aid in its detection and treatment. At about the same time it was found that syphilis could be transmitted to monkeys and rabbits which immediately opened up a field for chemotherapeutic investigations culminating, in 1910, in the brilliant discovery of salvarsan by Ehrlich, Bertheim and Hata. Thus in a space of only five years there was discovered the cause of one of the most important diseases of mankind, a blood test of unsurpassed diagnostic value in its detection, and a sovereign specific remedy for its treatment, constituting a triad of triumphs unparalleled in the history of medicine.

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INCIDENCE OF SYPHILIS

Syphilis is world-wide in distribution since all human races and both sexes of all ages are susceptible to it. The true incidence of the disease in the United States is unknown. Suffice it to state that it varies greatly in different localities and among different social groups from as low as 0.2 to 0.5 per cent to as high as 20 to 30 per cent. This incidence is higher among negroes than among whites and higher in cities than in urban communities. Estimates of the incidence have been based upon the results of blood tests but since the true incidence is always higher than that revealed by these examinations, the average for the whole country has been estimated to be as high as 8 to 10 per cent of the population. If this is true, more than 10,000,000 individuals in the United States have syphilis, most of whom either do not know they have the disease or regard themselves as having recovered from it.

It is believed that about 91 per cent of individuals contract syphilis between 16 and 40 years of age, with an estimated 500,000 to 600,000 new cases per year during normal times. Every person with acquired syphilis is considered potentially responsible for the infection of at least one to three or more additional individuals. Indeed, it has been estimated that about 1,000,000 of the potential mothers of this country have syphilis, and among syphilitic mothers only about 17 per cent of pregnancies result in the birth of living, non-syphilitic children. The remaining 83 per cent result in miscarriages, stillbirths, or living children with the disease. This means that each year about 25,000 infants are killed by

syphilis before birth while about 60,000 are born alive with it. All of this could be prevented and congenital syphilis wiped out if *all* women would seek medical care before the fifth month of pregnancy, if *every* physician would include a blood test routinely in his examination, and if every pregnant syphilitic woman were to receive prompt and adequate treatment. Practicing physicians frequently hesitate or refuse to have the blood tests conducted because of fear of offending the patient, but respectability and social position are no bars to infection with *Treponema pallidum*. Furthermore, since various blood examinations are conducted for the diagnosis of the anemias, diabetes mellitus, or Bright's disease, it is always possible for the physician to take a little extra blood for the syphilis tests without necessarily informing the patient. Fortunately, in hospitals, it is now a widespread routine custom to conduct the tests in all ward patients, with the result that many cases of the disease are discovered which otherwise would escape detection. Let it be fervently hoped that the same will be progressively true of all patients in private rooms and in private practice because syphilis strikes the high as well as the low and because an honest denial of all knowledge of having contracted the disease by no means excludes its possible presence.

In this connection it is also to be stated that since the Red Cross conducts blood tests for syphilis in all donors of blood for the preparation of plasma for use in our armed forces, a very large number of unsuspected cases of the disease have been detected. This constitutes a blessing in disguise for the individuals involved from the standpoint of treatment, although, as will be discussed later, the injection of plasma prepared of the blood of a syphilitic person carries no risks of transmission of the infection since *Treponema pallidum* is killed during the process of preparation and storage of the plasma in the dried state.

Premarital Blood Tests: Under the conditions I am thoroughly in favor of laws requiring blood tests for syphilis before marriage for the following reasons: (1) because the disease inevitably involves syphilitic men and women, in view of its high incidence; (2) because the detection and adequate treatment of syphilis before marriage will reduce its incidence; (3) because the tests are the most valuable single means for the detection of the disease after the primary or chancre stage; (4) because of the inadequacy of a negative history and clinical detection in applicants for licenses; (5) because the tests will help reduce the incidence of infection of marital partners and children by detecting the disease before marriage; (6) because the tests will reduce the economic hazards of marriage from incapacity to work or premature death of the husband or wife because of syphilis; (7) because the tests will reduce the incidence of divorce; (8) because the tests will greatly encourage the thorough treatment of syphilis and (9) because the tests are an excellent phase of the educational campaign against the disease.

Blood Tests During Pregnancy: For the following reasons I am also in favor of laws requiring blood tests during pregnancy: (1) they afford an excellent opportunity for detecting syphilis in both married and unmarried mothers, especially since pregnancy alone does not give falsely positive reactions when the tests are properly conducted; (2) because the detection and treatment of syphilis in pregnancy increases the chances of the birth of a healthy child with a reduction in the incidence of miscarriage and of infant mortality; (3) the detection of syphilis in pregnancy results in the treatment of the mother and especially during subsequent pregnancies; (4) the detection of syphilis in pregnancy may result in its detection and treatment in the child after birth and (5) the detection of syphilis in pregnancy may lead to its detection and treatment in the father and in other children.

TRANSMISSION OF SYPHILIS

In about 90 to 95 per cent of cases syphilis is acquired by sexual contact and for this reason is included among the venereal diseases. Most of the balance of cases are acquired extragenitally, especially on the

lips by kissing, on the fingers or other parts of the body. Since the germ, *Treponema pallidum*, dies quickly upon removal from the body, it is estimated that probably not more than one in ten thousand cases contract the disease from toilet seats, clothing, and so on. However, the immediate use of eating and drinking utensils, pipes, cigarette holders, after contamination by the saliva of syphilitic individuals with acute lesions on the lips or in the mouth, is far more dangerous.

Fortunately, not all persons sexually exposed to the disease contract it; about 10 per cent escape, not because they have a natural immunity to syphilis, but because of the removal or destruction of *Treponema pallidum* by prompt washing of the genitalia, douching, or the use of contraceptive jellies. Indeed prompt and thorough washing of the parts with hot water and soap, followed by the thorough application of a 33 per cent ointment of calomel, has proved highly successful in the prophylaxis of syphilis, especially in the case of men, although but seldom used by the laity in civilian life.

Syphilis may be transmitted during the incubation period of two or three weeks or more following exposure and infection before the development of a chancre at the site of inoculation. But the disease is most contagious during the primary or chancre stage and the secondary stage of the disease characterized by eruptions of the skin and mucous membranes, with special reference to the mouth; also during later periods when relapses of the disease result in active or open mucocutaneous lesions. In most instances the disease is contracted by exposure to syphilitic individuals infected within a period of two years. In the case of an individual with syphilis of five years' duration, the chances of transmission to others are about one in 20 or less and after ten years, one in 100 or less, although it is not possible to ignore the risks of infection in later years of the disease. The semen may be infectious during the first four years of the disease but rarely so thereafter, regardless of whether or not treatment has been given. It is thought possible, however, for an untreated syphilitic mother to transmit *Treponema pallidum* to a nursing infant by way of her milk during the first four or five years of the disease; under these conditions it is safer for her not to nurse her child.

Syphilis is also sometimes transmitted by blood transfusions. This accident is always most likely to occur if the untreated donor is in the early stages of the disease but may happen if he or she has had the disease as long as five to seven years. Otherwise there is but little or no danger but it is always advisable to exclude all syphilitic donors. In case of necessity, however, a syhilitic donor may be safely used providing neoarsphenamine or mapharsen is added to the citrated blood at least fifteen minutes before transfusion for the purpose of killing any spirochetes that may be present. Since *Treponema pallidum* is killed during the preparation and storage of plasma in a *dried* state, its injection carries no risks of infection. The same is true in the case of stored citrated blood providing it is at least three to five days old, since it has been shown that *Treponema pallidum* dies off in this period of time.

As previously stated, the danger of transmission of syphilis is always greatest during the early stages of the disease, embracing a period up to six months or a year following its contraction. Fortunately, however, adequate treatment, especially with arsphenamine, neoarsphenamine or mapharsen, quickly kills surface spirochetes and greatly reduces the chances of transmission. For this reason the prompt diagnosis and adequate treatment of the disease in the early stages places a heavy responsibility on physicians, not only in relation to the patient, but in relation to the protection of others exposed to the risks of infection. The same is true in the case of the mucocutaneous relapses of the disease, 95 per cent of which occur in the first three years of the disease. These dangerous relapses, as well as treatment-resistant cases of syphilis, are not due as much to the failure of the organic arsenical and bismuth com-

pounds in treatment as to the fact that the individual fails to develop an immunity to *Treponema pallidum*.

Up to this point my remarks have been confined to the transmission of syphilis among adults and do not apply to transmission to the infant in utero during pregnancy which constitutes congenital syphilis. Strictly speaking, the latter is acquired syphilis since it is syphilis acqured by the child through the placental transmission of *Treponema pallidum*. If a woman contracts syphilis during the last four to six weeks of pregnancy the child may escape infection in utero, but if she has a chancre or other early lesion in the birth canal the child may become infected during birth and develop what is known as infantile syphilis.

Formerly it was believed that a syphilitic father could transmit the disease to his child in utero without infecting the mother. This so-called paternal transmission of the disease, however, is no longer accepted. Rather it has been amply proved that syphilis is transmitted in utero only through the mother. For this reason it is a safe assumption that all mothers of syphilitic children have the disease regardless of the fact that they may show no clinical evidences of it and give negative serologic reactions.

Untreated pregnant syphilitic women are especially likely to transmit syphilis to their infants in utero during the first year of the disease. But the risk is not entirely removed by the passage of time and may be stated to be present during the whole of the childbearing age. Fortunately, however, syphiltic women may bear healthy non-syphilitic children and especially after the first year or two of the disease. This depends upon whether or not *Treponema pallidum* gains access to her blood during pregnancy with placental transmission of the germ to the child. As previously stated, *adequate* treatment during pregnancy guarantees the birth of a healthy non-syphilitic child almost as surely as vaccination prevents smallpox. In this connection it may be stated that syphilitic mothers should be treated throughout every pregnancy, regardless of the type or duration of her own infection or of the amount of preceding treatment. Furthermore, the treatment should be started as early as possible in every pregnancy.

CLINICAL STAGES OF SYPHILIS

Acquired Syphilis: Following infection with *Treponema pallidum* the parasite rapidly invades the lymphatics and the blood, but a sore does not appear at the site of inoculation until 10 to 90 days later (average, 21 days), which is called the incubation period. The painless, indurated, raised and eroded lesion is the chancre and this, along with some enlargement of the neighboring lymph nodes, constitutes the primary stage of the disease. However, the sore may be so small that it escapes detection or it may be regarded as only a hair cut, an innocent pimple or a simple blister. Or it may be situated in the urethra and produce a discharge which may be regarded as due to gonorrhea. At all events it is particularly likely to escape the notice of women. Not infrequently the victim makes his or her own diagnosis and goes to the drug store for a dusting powder for self medication. All of this may result in disaster. On the contrary, if the diagnosis of syphilis is made at that time with the institution of prompt and adequate treatment, the chances of complete recovery from the disease are at least 90 to 95 per cent.

Unfortunately, however, physicians themselves are frequently responsible for mistakes in diagnosis. Far too many depend upon their clinical judgment alone and forget that the primary sore on the genitalia can masquerade under a variety of conditions including chancroid and herpes genitalis. Under the conditions and always when in doubt, a darkfield microscopic test for *Treponema pallidum* should be made. In other words, it has been aptly and truthfully stated that the diagnosis of primary syphilis is no longer a clinical but a laboratory problem. But since it takes time for the antibody or reagin to be produced a blood test is never likely to give a positive reaction until the sore is present for at least 10 to 15 days. Under the conditions a single negative serologic reaction is a very

frequent cause for missing the diagnosis of syphilis in the primary stage although after two weeks, when the sore is healing and a darkfield examination may be difficult or impossible, positive reactions may be expected in about 70 to 80 per cent of cases.

Unfortunately there are even greater chances of missing the diagnosis if chancres occur on the lips, fingers or other parts of the body since they may not excite suspicion. Altogether too frequently a chancre on the lip is regarded as nothing more than a "cold sore" while one on the fingers is frequently mistaken for a streptococcus or staphylococcus infection. Under the circumstances chancres on the lips may be the means of transmitting the disease to others, especially by kissing, before the true diagnosis is made. Consequently, physicians and the laity as well should never ignore a persistent sore on the lips or fingers as there is always a chance that it may be syphilitic.

Under the conditions it is no wonder that about 30 per cent of men and 60 per cent of women, found in later years to have chronic syphilis, are perfectly honest and sincere in denying all knowledge of having contracted the disease. A negative history therefore is of little or no value in excluding its possible presence. Furthermore, and most unfortunately, such cases of primary syphilis may unwittingly spread the disease to others and become a public health menace conceivably greater than patients with frank and typical chancres.

At all events in untreated cases the chancre slowly heals in four to six weeks, frequently without leaving a scar. This is followed by a period of four to eight weeks during which the patient may be without symptoms or the disease masquerade under such general manifestations as malaise, chilliness, anemia, bodily aches and pains, headache and general enlargement of the lymph nodes. Fortunately, however, the blood tests yield positive reactions in about 80 to 85 per cent of cases and therefore constitute at this time a valuable means for the diagnosis of the disease which otherwise may escape detection.

At the end of this period syphilis reaches its secondary stage characterized by various skin eruptions and "mucous patches" in the mouth, on the prepuce or about the vagina or occur as condylomata in the axilla, perineum and female genitalia. As in primary syphilis, these lesions are highly infectious, but they may be so light and evanescent that they go unnoticed. Furthermore, they are not always easy of clinical diagnosis and at that time the great masquerader may resemble many different diseases of the skin. Fortunately, however, the blood tests give positive reactions in almost 100 per cent of cases.

The patient then enters a period of indeterminate length, varying from a few months to a lifetime, but averaging about seven years, during which there are no outward signs or symptoms of syphilitic infection, and the presence of the disease is detectable, if at all, only by means of blood and spinal fluid tests. This is the so-called latent stage and involves a large number of individuals unknowingly infected with syphilis and those who believe that they have recovered from it. In other words, the disease now masquerades under the disguise of good health which is the most treacherous of all. Blood and spinal fluid tests, however, yield positive reactions in over 90 per cent of untreated cases and are, therefore, of inestimable value in diagnosis. In the absence of ill health one may question whether or not treatment is necessary or advisable but I am among those who believe that if the patient is less than 60 years of age, it should be given with the hope and reasonable expectation of preventing further progression of the disease and its possible transmission to others.

In other words, the term "latent stage" is frequently a misnomer because in the absence of adequate treatment syphilis is not usually truly latent. Rather it is in a stage in which *Treponema pallidum* is slowly and progressively producing chronic inflammatory changes in the internal organs in spite of the absence of signs and symptoms of illness; under the conditions one could more properly speak of it as the "stage of

concealment." But sooner or later these inflammatory changes give rise to the signs and symptoms of the tertiary stage which is characterized by the explosive, destructive effects of gummata or by the breakdown of important tissues, especially in the cardiovascular or central nervous systems, resulting from the effects of chronic perivascular inflammation and fibrosis. Indeed, the disease may now affect practically any organ or tissue of the body—hence, tertiary syphilis is a disease encountered in every specialty in the practice of medicine and surgery. Furthermore, its manifestations may be so many and diverse as easily to escape clinical diagnosis. In other words the great masquerader may now resemble so many diseases of the heart, blood vessels, liver, stomach, brain, spinal cord, skin, bones, joints, eyes, ears, nose or throat, that the great Osler is reputed to have stated that to know syphilis in all of its manifestations is to know clinical medicine. Under the circumstances no one can even estimate the frequency with which physicians fail to detect the disease at this time. These signs of commission in diagnosis, however, would be greatly reduced if the blood and spinal fluid tests for syphilis were conducted more routinely, especially in private practice, since positive reactions occur in the great majority of cases of syphilis in this stage of the disease.

Congenital Syphilis: Frank clinical manifestations of early congenital syphilis at birth are rare at present, since so many syphilitic women receive some treatment during pregnancy. As a result, those children who are born alive are apparently normal at birth. It is extremely important, however, to determine the presence or absence of syphilis in infants as promptly as possible. For this purpose a darkfield examination of scrapings from the wall of the umbilical vein for *Treponema pallidum*, if positive, establishes diagnosis within a few hours after birth, but negative results do not exclude the disease. A positive blood reaction at birth or any time within two weeks thereafter does not necessarily mean that the child has syphilis, as it may be due to antibody or reagin passively transferred from the maternal blood through the placenta. But if positive reactions are consistently observed at intervals up to six or eight weeks, syphilis is present. If consistently negative over that period and at subsequent intervals of six months, one year and two years, it may be safely assumed that the child has escaped the disease.

Further aid in early diagnosis may be furnished by x-ray examinatins of the long bones two weeks after birth, but only if the mother has received no bismuth during pregnancy, as that compound may produce changes which are hard to differentiate from syphilitic osteochondritis. If diagnosis has not been established and treatment not instituted, clinical manifestations tend to appear within the first two or three months, if at all. These take the form of snuffles, skin lesions, osteitis and periostitis.

The clinical manifestations of late congenital syphilis, however, are so many and diverse that the great masquerader frequently taxes the utmost diagnostic skill of the physician. These include not only the so-called stigmata like the "saddle" nose, "dish-shaped" face, "sabre" shins, Hutchinson's teeth, corneal scars, and nerve deafness, but progressive active lesions as well. But few infants and children with congenital syphilis, however, will present such obvious manifestations that medical care is sought. Furthermore, a falsely negative blood reaction may occur, although positive reactions are observed in the majority. Otherwise unrecognized and unsuspected congenital syphilis is frequently discovered by the routine examination of the entire family of a parent who has the disease. The necessity for this becomes particularly important when the mother is found to have syphilis, or when another child is found to have congenital syphilis.

IMMUNITY IN SYPHILIS

As previously stated, natural immunity to syphilis probably does not exist among human beings. Numerous instances recorded in the literature purporting to know

the existence of individual immunity are explainable on the basis of accidental fortuitous escape from infection due to the intact epithelial barriers of the skin and mucous membranes. Races, however, vary somewhat in susceptibility to the disease and among those people in whom it is first introduced, syphilis is frequently more virulent than usual.

But immunity is undoubtedly acquired during an attack of the disease and has an extremely important influence upon the course of the infection and the subsequent fate of the individual. It begins to develop upon the appearance of the chancre and progressively increases during the secondary stage. It is undoubtedly responsible for the latent stage of syphilis, following which it begins to fluctuate and to diminish. Treatment just sufficient to heal the chancre and secondary lesions but insufficient to effect a complete cure is, therefore, more likely to be harmful and dangerous than no treatment at all because it reduces the degree of acquired immunity. Consequently, once the treatment of early syphilis is started it must be thorough in order to effect a complete cure. This places a heavy responsibility upon the physician and should be always carefully explained to the patient. Otherwise the inadequate treatment of syphilis during the first four years, especially during the first year, favors the dissemination of *Treponema pallidum* throughout the body and may do more harm than good although inadequate treatment is much less dangerous after that time. In other words, the thorough treatment of early syphilis replaces immunity but is less essential in chronic syphilis.

The nature and mechanism of this acquired immunity to syphilis is not completely understood. Undoubtedly it is largely of the tissue type and in many respects is similar to the acquired immunity of tuberculosis. It is engendered only by living *Treponema pallidum* or an actual attack of the disease and cannot be produced by active immunization with vaccines prepared of the killed spirochetes. Consequently there is no method for vaccination against syphilis. Nor can the immunity be produced by an attack of yaws, relapsing fever, malaria or any other disease. Small amounts of specific antispirochetal antibodies also occur in the blood and doubtless play some part in the mechanism of this acquired immunity. But these antibodies have so little curative properties that there is no effective method for the treatment of syphilis with convalescent human serum or the sera of horses or other animals immunized by injections of *Treponema pallidum*. Apparently women develop this immunity in higher degree than men; the reason is unknown but it may be due to the influence of the female sex hormones.

The important question arises of whether or not this acquired immunity is sufficient for bringing about complete recovery from syphilis unaided by specific treatment. It has been stated that about 25 per cent of cases of the disease may undergo spontaneous recovery due to the immunity alone but the evidence is not conclusive. In my opinion it is both unwise and dangerous for any individual with syphilis to assume that recovery will follow by maintaining good health through exercise and diet alone unaided by adequate treatment. Indeed, the immunity may not suffice for the prevention of super-infection which means that an individual may contract a second attack of the disease before completely recovering from the first, although a chancre may not develop when the second attack occurs. It is also stated that re-infection, which means a second attack of syphilis, indicates that complete biologic cure of the first attack has been accomplished but this is no longer thought to be necessarily true. It may be that the immunity persisting after complete cure may prevent re-infection or a new attack of the disease, but this can never be relied upon and it appears both wiser and safer for the individual to assume that he or she is again vulnerable to a second attack.

SEROLOGIC TESTS FOR SYPHILIS

In no other disease have blood or serologic tests been as widely and usefully employed as aids in diagnosis as in syphilis.

The original Wassermann test and many of its earlier modifications are no longer employed but, fortunately, its intrinsic merit enabled it to survive all the abuses committed in its name. Newer and superior methods in both complement-fixation and flocculation procedures have been developed during the past twenty-two years with the result that those commonly and widely employed at the present time have proved to possess a high degree of sensitivity and practical specificity when conducted exactly as described by their author-serologists. Even under the best of conditions errors can occur but their incidence is to a large extent in relation to the skill and experience of those who conduct them. *No test can be better than the laboratory conducting it.* But common sense in their use and interpretation is essential. They do not always provide an easy or royal road to diagnosis; after all, they are usually only additional diagnostic aids although in chronic latent syphilis they may be and frequently are the sole means for detecting the disease. Final judgment and responsibility in their interpretation is properly the function of the physician and he should not attempt to "pass the buck" to the technologist who is doing his or her full duty when seeing to it that the tests are conducted exactly as they should be, using every known precaution against error and reporting the reactions exactly as observed and not as the physician expects or desires.

As previously stated, in view of the wide prevalence of syphilis in both sexes and all races, the frequency with which it is responsible for chronic disease when not suspected clinically, and the fact that a negative history and respectability are unreliable in excluding the possibility of its presence, renders advisable the routine use of the tests in the majority of patients in both clinic and private practice. Indeed, physicians as a whole need to be more "syphilitic conscious" and to suspect the possibility of the great "masquerader" among both the high and the low.

The serologic tests for syphilis should possess the maximum of sensitivity consistent with specificity. They are divisible into two kinds, namely: (a) complement-fixation or Wassermann, and (b) flocculation tests, the latter being subdivided into macroscopic and microscopic procedures. The nature of the antibody-like substance concerned in their mechanism is unknown but since it does not appear to be a true antibody it is commonly designated as a "reagin." As previously stated, agglutinins and complement-fixing antibodies for *Treponema pallidum* are produced in syphilis but appear to be separate and distinct from the reagin. At least complement-fixation or Wassermann tests conducted with antigens prepared of cultures of alleged *Treponeum pallidum* do not appear to be of as much practical value as antigens prepared of the lipoids extracted from beef heart or other mammallian tissues. Furthermore, tests conducted with spirochetal antigens are far more likely to yield falsely positive reactions due to the fact that a large percentage of normal persons carry in their blood a nonspecific spirochetal antibody giving group reactions with antigens prepared of *Treponema pallidum* and other spirochetes.

None of the present serologic tests is sufficiently sensitive to detect all cases of syphilis. Nor can this be reasonably expected since in both early and late cases of the disease there may not be sufficient amounts of the reagin in the blood to give positive reactions. Consequently, negative reactions and even repeatedly negative reactions should not be permitted to over-ride clinical judgment. All of the tests now in use can be made more sensitive but only at the risk of giving falsely positive reactions. In my opinion it is far better to miss the serum diagnosis of occasional cases of chronic latent syphilis than to incur unnecessary risks of falsely positive reactions with all that this may mean to the individuals concerned. But since there is no one best test for syphilis, I believe that, when conditions permit, the serum diagnosis of syphilis is best served by testing each serum by at least two methods routinely and that one of them should be a complement-fixa-

tion or Wassermann test of acceptable sensitivity and specificity. When one test gives a positive reaction and the second test gives a negative reaction the results should be regarded as doubtful. In other words, multiple tests may yield discordant reactions and especially if sera or spinal fluids contain but small amounts of reagin. The same is true when portions of the same blood are sent to different laboratories or to the same laboratory under different names as "split specimens." But doubtful reactions should not be ignored as they frequency indicate the presence of syphilis. Under the conditions the tests should be repeated along with thorough clinical examinations for the purpose of reaching a final decision.

Unfortunately falsely positive reactions are of frequent occurrence but are less likely to occur in complement-fixation than in flocculation tests. They are divisible into two kinds, namely: (a) technical and (b) biologic or those occurring with the sera of normal individuals and in diseases other than syphilis. Technical falsely positive reactions may be due to contamination, improper storage or delay in sending specimens to the laboratory, or the mislabelling of specimens on the part of the physician or to errors in the laboratory. Such errors occount for the majority of falsely positive reactions. Biologic falsely positive reactions may occcur with the sera of perfectly normal nonsyphilitic individuals but are rare. The great majority are the result of other diseases and especially yaws, pinta, leprosy, malaria, vaccinia and vaccinoid, infectious mononucleosis and virus pneumonia. Falsely positive reactions may also occur in some cases of upper respiratory tract infections, active tuberculosis, septicemia, subacute bacterial endocarditis, acute lupus erythematosus, relapsing fever, rat bite fever, infectious jaundice, typhus fever, trypanosomiasis and possibly in other diseases as well. Their management in practice is always a difficult problem. When suspected, the tests should be repeated with great care and skill to avoid technical nonspecific reactions. Judgment and treatment should be withheld and the test repeated over a period of at least three to six months. If negative reactions occur, syphilis may usually be excluded; if positive reactions persist, syphilis is probably present, if malaria and leprosy can be excluded, then treatment is advisable.

In other words, when the possibility of falsely positive reactions can be excluded positive reactions by properly conducted tests of proved value are almost invariably indicative of syphilis. Unexpected reactions should always be rechecked before the patient is informed or treatment instituted in order to guard against falsely positive reactions. On the other hand, they should never be ignored or disregarded as they may be the only evidence of syphilis. The value of verification tests is uncertain but they are worthy of trial. Provocative serologic reactions are sometimes of value in the diagnosis of untreated syphilis presenting suspicious lesions with negative reactions; also in cases presenting no lesions with weakly positive or doubtful serologic reactions.

The serologic tests are also of value as an aid in guiding the treatment of syphilis. But the treatment of early syphilis should be thorough and adequate regardless of negative reactions. After the cessation of treatment of early syphilis repeatedly negative reactions over a period of two years are among the criteria of cure. At least one examination of the spinal fluid is also required.

Persistently positive reactions in early and late syphilis, in spite of thorough treatment, are indicative of persistent infection giving "Wassermann-fastness" or "treatment resistance." Needless to state the incidence of such cases is in intimate relationship to the sensitivity of the tests employed. In early syphilis they are frequently due to inadequate treatment with infection of the cardiovascular or central nervous systems but when they occur in spite of thorough treatment it would appear that they are due primarily to the fact that the patient has failed to develop an effective degree of immunity. They always present

one of the most difficult problems in the treatment of syphilis because they are so discouraging to both physician and patient. Under the circumstances it is advisable carefully to explain matters to the patient. Certainly if treatment is given it is primarily for the purpose of preserving good general health and longevity rather than for the mere purpose of securing negative serologic reactions. In other words, it is the patient rather than his positive reactions that requires therapeutic management.

It is always advisable to examine the cerebrospinal fluid at the end of about six months of treatment in early syphilis and at once in all cases of late syphilis. These tests should include a total cell count, a test for protein, the collodial gold or mastic tests, and the complement-fixation or a flocculation test. Negative results do not necessarily exclude possible infection of the central nervous system. About 25 per cent of all untreated cases of syphilis develop some type of neurosyphilis embracing about 5 per cent paresis, 5 per cent tabes dorsalis and 15 per cent diffuse meningovascular syphilis. Even modern intensive treatment does not eliminate the possibility of 1 to 3 per cent cases of tabes or paresis. The hope of escaping these dreadful diseases depends upon early examination of the cerebrospinal fluid and prompt treatment with tryparsamide with or without fever therapy. Under the circumstances no case of syphilis can be regarded as "cured" without at least one or more thorough examinations of the cerebrospinal fluid with completely negative total cell, protein, Wassermann and collodial gold or mastic reactions.

CURABILITY AND PROGNOSIS OF SYPHILIS

Is syphilis curable? Needless to state the anxious patient is mostly concerned about his or her chances of becoming and remaining well with no later trouble from the disease. The answer depends upon what is meant by "cure." *Biologic cure* means the complete and total eradication of the infection and is the ideal objective of treatment. *Serologic cure* means that the blood and spinal fluid reactions have become persistently negative; unfortunately, however, this is not necessarily synonymous with biologic cure since the patient may still harbor foci of infection capable of subsequent progression or relapse with the return of positive reactions and the need for further treatment. *Symptomatic cure* means that the patient has become and remains well, so far as syphilis is concerned, for the balance of life with no danger of transmission of the disease to others. In other words, the latter means the "clinical arrest" of the disease even though positive blood or spinal fluid reactions, or both, persist for the balance of life. Opinions vary as to whether or not it is advisable or necessary to give periodic courses of treatment for the maintenance of the state of good health in the presence of positive blood or spinal fluid reactions. Personally, I am convinced that the latter are indicative of persistent infection and it is my custom to advise the patient to take two short courses of treatment per year, each consisting of six to eight intramuscular injections of bismuth at weekly intervals, for the purpose and with the hope and expectation that they will aid in keeping the infection in a state of clinical latency.

It is not my purpose to discuss the therapy of syphilis but suffice to state that it appears reasonably certain that the treatment of primary and secondary syphilis with the organic arsenical and bismuth compounds by the continuous method of the Clinical Cooperative Group, or modifications of it, over a period of about fifteen months, results in the biologic cure of at least 80 to 95 per cent of cases. But is it possible to achieve these results in a shorter period of time and with less expense? The need for this has lead to great interest at the present time in the massive arsenotherapy of the disease familarly known as the "five-day," or "ten-day," "three weeks" and similar plans of treatment. In my opinion the "five-day" treatment, consisting of three or four injections of arsphenamine, neoarsphenamine or mapharsen per day, is too dangerous because of the production of severe and even dangerous toxic reactions like encephalopathy, hepatitis, exfoliative

dermatitis, neuritis and blood dyscrasias in about 3 to 4 per cent of cases with an occasional death. As recently reported by Thomas and Wexlar and the United States Public Health Service, one intravenous injection of marpharsen per day for ten days with intravenous injections of typhoid-paratyphoid vaccine on the second, fourth, sixth and eight days for the production of fever is safer, results favorably in about 80 per cent of cases of early syphilis, but carries a mortality of about 0.3 per cent. Eagle has reported that three intravenous injections of mapharsen alone per week for eight to twelve weeks gives poor results in the treatment of early and latent syphilis but if these are given along with weekly intramuscular injections of bismuth subsalicylate, much better results are secured, amounting to the probable biologic cure of 85 to 90 per cent of cases of early syphilis. In a series of 4,823 cases, however, severe toxic reactions were observed in 39 with four deaths. Where short and intensive treatment is thought advisable, however, this method would appear to be the safest and most desirable although, for my own part, I prefer not to have my patients incur the risks and for this reason much prefer the slower and safer continuous treatment over about fifteen months, according to the plan of the Clinical Cooperative Group. Indeed, if a patient with primary or secondary syphilis insists upon short intensive therapy, I believe that injections of penicillin over eight days, along with mapharsen, as described by Mahoney, are likely to be just as effective and certainly much safer because of the extremely low toxicity of this compound, although the final results of penicillin therapy in early syphilis and its value in the treatment of latent and chronic syphilis cannot be stated in final terms at the present time.

At all events, it does not appear that complete recovery or the biologic cure of syphilis is possible when treatment is instituted two years or longer after the disease has been contracted. But thorough treatment with the organic arsenicals and bismuth compounds or, possibly, with penicilin is always promising and very hopeful from the standpoint of effecting symptomatic cure with the maintenance of good general health for the balance of the usual span of life. Even in active tertiary syphilis with disease of the brain, spinal cord, cardiovascular and other organs and tissues, careful, judicious and thorough treatment is usually effective in ameliorating the signs and symptoms or reducing the progress of the disease. Certainly the old dictum *"once syphilitic always syphilitic"* is no longer necessarily true and especially in relation to the adequate treatment of early syphilis; indeed, both the medical profession and the laity should realize the truth of this well established fact.

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IMPORTANT CONSIDERATIONS IN CATARACT SURGERY*

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As is true of most other surgical procedures, the act of cataract extraction is merely one of the steps in the chain of events by which the patient with this type of pathologic change is relieved of his disability. The ophthalmologist who operates without careful preliminary investigation or who slights postoperative care is likely, no matter how excellent his surgical technic may be, to achieve results that are less than satisfactory, or certainly that are less good than he might have achieved had he given more attention to these phases of the management of the case.

The remarks in this paper are based on my personal experience in more than 300 cases of cataract extraction, as well as on my personal observation of at least as many more cases handled by other surgeons. Although the recent literature of the subject has been reviewed, references are omitted, since the discussion is limited chiefly to

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* These observations are based on the author's experiences in civilian practice, not on experiences in the Army.

standard, non-controversial aspects of cataract surgery.

PRELIMINARY STUDY OF THE PATIENT

Although cataracts, with the exception of certain special varieties to be mentioned later, occur chiefly in aged persons, the age is seldom a factor in operation for cataract. There is little more risk in operating upon a patient 80 years of age or even older than upon a patient in the fifth or sixth decade, provided that his general physical status is satisfactory and, in particular, that his cardiovascular system is competent. In other words, not the age of the patient but his physical status determines the safety of operation and plays an important part in its outcome.

The corollary of this fact is the necessity of a preliminary examination of the patient with cataract, which will supply information upon four important points: (1) the exact pathology present; (2) selection of the time for operation; (3) selection of the type of procedure to be employed; (4) determination of the patient's systemic status. The first three of these considerations are the business of the ophthalmologist. In the study of the fourth the cooperation of a competent internist is of great assistance and often is indispensable.

Such conditions as glaucoma, detachment of the retina, and choroiditis are frequent complications of cataract, and the ophthalmologist must always be on the alert for their presence. Intraocular tension should always be determined. The condition of the retina can be largely determined by light perception, light projection, and the "two-light test," and the condition of the lens can be determined by the use of the slit lamp.

Systemic disease is usually considered a contraindication to ocular surgery if the general physical status of the patient is such that the operation might precipitate a serious crisis in the constitutional disease or if the constitutional disease might seriously influence the results of operation. In such cases preoperative preparation is of great importance. Hypertension is an excellent illustration of this statement. Whenever extreme hypertension complicates cataract, the patient must be treated by absolute bed rest, supplemented by sedatives and magnesium sulfate. It must be added, however, that the condition of the retinal vessels is as much a factor in hemorrhage as is arterial hypertension.

Pulmonary conditions such as chronic bronchitis, bronchiectasis or asthma are associated with cough and are likely to be aggravated by the recumbent position necessary after cataract extraction. Cough always has a deleterious effect, and adequate measures should be taken before operation to control it.

Controllable diabetes is not a contraindication to cataract extraction, though it is essential that the patient be on an adequate and properly supervised diabetic regimen. No change should be made in the treatment before operation, and after operation, as will be pointed out, every attempt should be made to bring the diet to the caloric value to which the patient has been accustomed.

Opinions differ as to the wisdom of elimination of foci of infection before operation. Even though such foci may not be the etiologic factor in the ocular disease, their presence is not conducive to rapid healing of the surgical wound, and they should be corrected so far as possible before operation. On the other hand, it would not seem sound logic to subject an elderly individual with cataract to preliminary tonsillectomy or some other major surgical procedure unless the condition for which operation was proposed was known to have a direct bearing on the case. Uncompensated cardiac disease, hypertrophy of the prostate gland, hemorrhoids, and even chronic constipation may complicate the postoperative course and therefore may require preoperative attention.

The patient's usual diet should be carefully investigated, since dietary deficiencies are known to bear some relation to wound disruption and delayed healing. A properly balanced diet, supplemented, if necessary, by vitamin therapy should be instituted well in advance of operation.

The general statement may be made that patients with constitutional disease who respond to preoperative measures may be submitted to cataract extraction with little more risk than patients without such handicaps. Patients who do not respond to adequate preparation fall into a different category, and it may even be necessary to refuse operation to a small group of such subjects.

It is quite important that the surgeon acquaint himself with the temperament and mental status of his patient as with his physical condition. Confidence between them is essential. The patient must understand what is expected of him and what, in turn, he may expect of his physician. If he realizes the importance of his own behavior, if he is confident that he will experience little or no pain, if he trusts the ability and judgment of his surgeon, he will almost invariably behave well during operation and will furnish the required cooperation during convalescence.

From the standpoint of asepsis, many authorities believe that special preoperative measures should be employed. Some apply a trial bandage for varying periods of time before operation. Some advise irrigations with various solutions or use yellow oxide of mercury ointment or instillations of argyrol. Some employ foreign protein therapy for several days before operation or use triple typhoid vaccine. I do not personally believe that these or any other measures are necessary if one is certain that the conjunctiva and lacrimal sac are clean and if the conjunctival smear is negative.

SURGICAL CONSIDERATIONS

As has already been implied, two major surgical problems confront the surgeon in every case of cataract extraction, namely, when to operate and what type of procedure to employ. In general, the decision as to when to operate depends upon the variety of cataract with which one is dealing.

The most favorable time for operation for senile cataract has arrived when the patient can no longer get about comfortably and can no longer carry on his usual occupations. Now that improved methods of intracapsular and extracapsular extraction have been devised, it is no longer necessary to wait until a marked degree of incapacitation has set in, and the loss of time from work can be minimal.

The patient with monocular cataract should be operated on as soon as cataract maturity is reached for three reasons: In the first place, binocular vision is better and safer than monocular vision. In the second place, the longer the operation is deferred the greater is the age of the patient and the greater is the possibility of systemic complications. Finally, the sooner the operation is performed the less is the risk of secondary glaucoma and iritis from cataract hypermaturity.

In the patient with bilateral cataract the question of operation on the second eye often arises after a good result has been obtained on the first eye. In my own opinion, there is no question of the wisdom of the second operation. Unless some serious contraindication has developed, extraction of the second cataract should follow promptly the extraction of the first.

The time at which operation should be performed in congenital cataract depends upon whether the opacity is limited to the pole or extends to the nucleus. When complete visual obscurity is present it is best to operate as promptly as possible, even as early as the third month of life, because otherwise central fixation will not develop and ocular nystagmus will result. If vision is not entirely obscured, prompt operation is less urgent and operation may be postponed, if desired, until early childhood.

In traumatic cataract which is the result of a penetrating injury, with extensive damage to the lens, it is best to remove as much of the lens as possible immediately upon seeing the patient, provided that not more than eight hours have passed since the injury. After that time, and always if an inflammatory reaction has been set up, it is wiser to delay removal of the lens substance until the inflammation has been controlled.

Dinitrophenol cataract should be observed closely, and the lens should be re-

moved promptly if signs of increased intraocular tension appear; otherwise an acute glaucoma may develop.

It is difficult to make dogmatic statements about cataracts with healed cyclitic changes, many posterior synechiae, and thickened capsules. If vision is so poor as not to be useful at all, operation can be carried out six or eight months after the process has subsided. When vision is still useful, the problem arises as to whether one should operate with the hope of improving it still further or should refrain from operation for fear of stirring up a devastating inflammation. Each case of this kind must be settled on its own merits.

TECHNICAL PROBLEMS

From the standpoint of technic, the surgeon must choose between corneal section or a conjunctival flap, between combined extraction or preliminary iridectomy, and between simple extracapsular extraction or intracapsular extraction. The object of all these procedures is to achieve for the patient the best possible result with the least possible risk, and often conditions present in the individual case determine the procedure to be employed. In the absence of such determining factors, I myself have come to believe that the choice of operative technic should depend to a very large degree upon the skill which the individual surgeon has acquired in some particular technic or in his own personal modification thereof.

The question of when iridectomy should be done is still a matter of vigorous discussion in ophthalmologic circles. There are many advantages in its performance as a preliminary procedure. It increases the visual acuity of patients with immature cataract. When subsequent extraction is carried out, the most painful part of the operation has already been completed, and there is no risk of hemorrhage into the anterior chamber from the cut iris. It is of advantage in cases of chronic simple glaucoma associated with megalocornea and hypermature cataracts, and it will usually prevent the iritis which sometimes occurs when combined operation is done. It aids in the determination of the condition of the vitreous and determines the presence of a previous uveitis. It is therefore an aid in prognosis. It permits the surgeon to become acquainted with the reaction of his patient to the surgical procedure, and it permits the patient to become somewhat oriented in the operating room, though an apprehensive individual may be made more nervous at the thought of a second operation. The chief disadvantages of preliminary iridectomy are that it involves two penetrations of the ocular coats, with the added risk of exogenous infection, and that the two periods of hospitalization necessarily increase the patient's expense.

Iridectomy facilitates intracapsular operation if that particular technic is employed. If the extracapsular procedure is employed, it makes removal of the cortex easier and furnishes more space for sweeping the cortex out of the anterior chamber. In both procedures it serves to reduce the incidence of prolapse of the iris. Some surgeons advise it as a routine unless the operation is performed for cosmetic purposes in a young subject. To me, the chief disadvantages of iridectomy are of little consequence. They are: (1) the cosmetic result, that is, the irregularity of the pupil, and (2) the inability of the iris to regulate the amount of light entering the eye.

Although the intracapsular operation has many advocates, the extracapsular operation is generally considered the procedure of choice in juvenile, congenital, traumatic, and secondary cataracts. It is also of advantage in cataracts in bulging eyes, cataracts complicated by glaucoma, and glaucomatous cataracts, as well as in cases associated with cough, asthma, high blood pressure, high myopia and fluid vitreous. One-eyed and excitable individuals seem to do better when this technic is used, and some advocate its routine use in patients under 50 years of age whose zonular fibers are likely to be rather strong. Many writers feel that it is indicated in the morgagnian type of cataract and other hypermature cataracts and in senile cataracts in the in-

tumescent stage, because of the difficulty of grasping the tense capsule.

My own preference is for the extracapsular procedure which creates and leaves intact a large conjunctival bridge. McReynolds either divides the bridge, using sutures which he retracts to the side, or leaves the bridge intact, making his assistant grasp its lip and pull it down and forward over the cornea, these maneuvers answering the frequent objection to the bridge that it creates difficulties in the performance of the intracapsular operation. On the other hand, the use of the bridge has several obvious advantages. It prevents inversion or eversion of the corneal lip. It facilitates rapid removal of the speculum should this become necessary. It helps to prevent the corneal lip's being caught by the upper lid during the operation and in postoperative dressing. My own impression is that healing is more rapid and closure of the wound is more prompt when the bridge is present postoperatively.

Although, along with most other writers on the subject, I prefer the extracapsular technic, it must be granted that the intracapsular procedure has certain advantages. Earlier operation may be performed when it is used, a second operation with its possible complications is avoided, and iritis does not develop. The great disadvantage of the technic is the high incidence of the loss of vitreous and the accompanying complications, chiefly prolonged healing with wrinkling of the cornea, detachment of the retina, delayed uveitis, secondary glaucoma, and panophthalmitis.

Regardless of the technic selected, the most important part of the operation is the character of the section. The judgment of the surgeon is dependent upon his knowledge of the pathologic changes in the diseased eye, especially his knowledge of the size and consistency of the lens, the depths of the anterior chamber, and the zonular relationship of the capsule.

POSTOPERATIVE CARE

Postoperative care in cataract largely resolves itself into close observation by the surgeon, supplemented by competent nursing. Following operation the patient is kept on his back for a period of 24 hours, with his head on a pillow, to reduce the intracranial blood pressure. At the end of this time he is allowed to turn on the sound (unoperated) side and is permitted a second pillow. Since movement of the facial and jaw muscles is undesirable, he is fed a liquid diet, preferably for four or five days, though as already intimated it may be necessary to violate this rule in the case of diabetic patients, whose diet must be brought to its normal caloric value as promptly as possible. Small doses of mineral oil are given twice daily. Sedatives are used if the patient is nervous or irritable.

If nausea occurs following operation, the bandage is removed from the sound eye, the patient is placed on a backrest on the sound side, and a sedative is administered. Backache is more often complained of than local pain and can be avoided by furnishing adequate support, both on the operating table and after the patient is returned to bed. It is sometimes caused by an accumulation of gas in the lower bowel. If the application of heat is not effective, a rectal tube may be inserted, especially when distention is present.

Under ordinary circumstances the eye is left undisturbed for 48 hours after operation. Then the bandage is removed, the wound is dressed, atropine is instilled into the eye and the bandage is re-applied. On the third day eserine (0.5 per cent) is instilled into the eye. Thereafter the wound is dressed daily. The patient is usually permitted to leave the hospital on the tenth day, at which time he is warned of the importance of protecting the eye and is told of the serious complications which may follow a slight blow to the eye or head, or even any sudden jarring. He is required to wear a bandage at night for at least a month after operation.

OPERATIVE AND POSTOPERATIVE COMPLICATIONS

Regardless of the surgeon's skill and of his knowledge of local anatomy and of the pathologic changes in the special case, unforeseen situations may occur, both during

operation and afterward, which tax his judgment to the utmost. These situations are chiefly due to the pathologic conditions present but may be aggravated by an unwise choice of procedure. Among the most important of these complications are the following:

Hemorrhage: Postoperative hemorrhage is a frequent complication, especially in diabetic subjects and in cases of vascular disturbance of the uvea. It arises most often from the vessels of the limbus and less frequently from the iris. Hemorrhage into the anterior chamber is not usually serious, but the same statement cannot be made concerning choroidal or expulsive hemorrhage. This type, fortunately, is unusual, for it practically always destroys the eye. Whether it occurs at the conclusion of the incision or is delayed until as late as the tenth postoperative day, it seems to depend upon the degree of vascular degeneration present in the choroid.

Vitreous Loss: This is a complication that in some cases is unavoidable. Liquid vitreous, the use of too much pressure, and attempts at expression in an uncooperative patient are all conducive to it. The presentation of the vitreous immediately following the completion of the section is a serious complication which requires immediate but at the same time deliberate action. My own plan, when it occurs, is to lift the speculum carefully and then to close the lids gently for a period of two or three minutes. At the conclusion of this time, the upper lid is lifted with a muscle hook and the eye is examined, the subsequent procedure being determined by the findings.

Ruptured capsule associated with vitreous loss is one of the most serious complications of the intracapsular operation. The bursting of the capsule does not resolve the operation into simple extraction with capsulotomy. The posterior lens capsule has been dislocated, and unless the capsule and retained cortex can be removed entirely with the capsulotomy forceps, a very dense cataract will be the result. Even if the capsule has been removed, the difficulty of milking out flocculent cortex without further loss of vitreous will be considerable.

Glaucoma: This complication may result: (1) from prolapse of the iris or lens capsule, with healing in the wound, or (2) from the ingrowth of epithelium into the anterior chamber which, by epithelization of the filtration angle, reduces filtration and brings about a resulting increase in intraocular pressure. Another possible cause is the injudicious use of mydriatic and myotic drugs after operation. Needling, although considered a simple procedure, actually involves quite as much hazard as the original extraction because it causes excitation within the closed eyeball, without at the same time provision for the safety of drainage. I personally know of no condition in cataract work which is more dangerous to the eye and more difficult to treat successfully than postoperative glaucoma.

Iritis: Iritis occurs much more frequently after the extracapsular than after the intracapsular technic. Possible causes include the leaving of the lens cortex or capsule remnants in the anterior chamber, trauma, circulatory disturbances, adhesions of the iris in the wound, increased intraocular tension, and hemorrhage into the anterior chamber.

Rupture of the Wound: This is a grave complication which may be caused by trauma or is occasionally observed in restless patients, who turn in bed unaided during the first few hours after operation. Some authorities believe that vitamin C deficiency may be a factor. The accident may result in adhesions, incarceration, or prolapse of the iris or vitreous, collapse of the anterior chamber, or hemorrhage into the anterior chamber with subsequent iritis.

Prolapse of the Iris: This also is a serious complication, since the smallest degree of prolapse is a potential source of danger as well as a constant source of pain and discomfort. It requires further operative measures for its treatment.

Sympathetic Ophthalmia: This is one of the most disastrous and disappointing results which can follow cataract extraction. Fortunately, it is not frequent.

Retinal Detachment: When retinal detachment has occurred very little can be done to bring about re-attachment, operative results being generally disappointing. The accident can be prevented, however, by elimination of excessive vitreous loss and by prevention of chronic uveitis with subsequent softening of the globe.

Infection: Purulent inflammation of the eye following cataract extraction may be exogenous or endogenous, the former variety being most frequent. Treatment is seldom satisfactory, and the eye is usually lost, though the outlook is somewhat more hopeful since the introduction of the sulfonamide drugs.

Asteroid Hyalitis: This is a rare complication and is compatible with reasonable vision.

PROGNOSIS

The chances of recovery in the uncomplicated cases of cataract are generally good, and the patient is usually able to resume his former occupation to a moderate degree if not entirely. On the other hand, it is not reasonable to expect notable improvement following cataract extraction in a patient who gives a story of visual changes before the formation of the cataract, and such an outcome is practically never observed.

SUMMARY

1. The best results in cataract extraction are secured by careful preliminary study of the patient, correction or control of associated constitutional conditions, and constant postoperative observation supplemented by adequate nursing care.

2. From the surgical standpoint the chief problems are when to operate and what special procedure to adopt. The advantages and disadvantages of the various technics are briefly discussed.

3. The complications of cataract extraction are frequently very serious, and measures to prevent them are usually more successful than measures to control them.

4. The results in uncomplicated cataracts are usually good after extraction. If the impairment in vision has existed before the formation of the cataract, naturally its removal will not materially improve the patient's condition.

SINUS DISEASE PRODUCING MONOCULAR PROPTOSIS*

WITH CASE REPORTS AND WITH SPECIAL REFERENCE TO MUCOCELE (PYOCELE)

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Mucocele or pyocele, of which monocular proptosis is perhaps the most striking manifestation, presents certain rather curious aspects. The older texts, such as those of Skillern[1] (1923) and Hajek[2] (1926) discuss the condition in considerable detail; there are ten separate references to it in Hajek's text. Recent texts, such as Thomson and Negus'[3] (1937), Morrison's[4] (1937), and Ballenger and Ballenger's[5] (1943), pay only scant attention to it. In the English literature authoritative articles on the subject were written by Logan Turner[6] and by Howarth (Hunterian Lecture)[7] in 1921. But since 1935 the literature has contained only occasional case reports, though with the technical improvements which have recently occurred in roentgenology, one might have expected an increase in the discussion at least from the diagnostic standpoint.

Without a complete review of the literature, which I have not attempted, it would be impossible to state the exact number of recorded cases. There are duplications and overlappings in the various collected series. In 1921 Dabney[8] was able to collect 74 cases from a review of fifty-eight articles written since 1881. Beyer[9] states that Gerber (to whose original article I have not had access) collected 169 cases in 1909, including some of the cases later collected by Dabney. The largest personal series on record is the 10 cases reported by Logan Turner in 1907, the 14 cases reported by Howarth in 1921, and the 30 cases reported by Boenninghause (cited by Beyer) in 1923. I have personally observed six cases in adults,

*Read before the sixty-fifth annual meeting of the Louisiana State Medical Society in New Orleans April 24-26, 1944.

in addition to the two cases in children which I am reporting in this communication, and the comment is probably warranted that while the condition is not common, it is not at all rare.

Conflicting statements are made as to the age at which the disease occurs, a discrepancy to which Howarth called attention in his Hunterian Lecture. Dabney, on the basis of the 74 cases which he had collected, stated that its occurrence in youth is one of the distinguishing characteristics of mucocele. Garretson,[10] without making clear on what grounds he had formed his opinion, stated that it was a disease of later middle life. In the 25 cases which I have located in a casual survey of the literature since 1921, the date of Dabney's report, the age range was from 12 to 80 years, one patient being described merely as "elderly." All but four of the patients were over 20 years of age, and 11 were over 35 years of age. Because the disease is known to be of slow development, I should be inclined to take the position that it is more frequent in adult than in early life. So far as I have been able to gather from the literature available to me, the two patients I am reporting herewith, in one of whom the mucocele was classified as incipient, seem to be among the youngest in whom the disease has been observed.

I am presenting these case reports in greatly abbreviated form, since a sufficient number of instances are now on record to make a great deal of detail unwarranted. The ophthalmologic aspects of both cases will be discussed by Dr. W. B. Clark, whom I called in consultation in the first case, and who, because he recollected it, called me into consultation in the second, in which he himself had been called as consultant by Dr. Gilbert C. Anderson.

CASE No. 1

D. B., a white girl 14 years of age, had always suffered from colds. In the fall of 1942 she began to complain of headaches, and the left eye began to swell and protrude intermittently; the symptoms lasted only for a day or two at a time, but recurred every seven or eight weeks. The symptoms and signs were regarded as a phase of the girl's habitual colds, and no attention was paid to them. They disappeared entirely during the late spring and summer of 1943, but recurred in the fall of that year, at which time the patient was brought to my office. All symptoms except those stated were denied, and physical examination was essentially negative except for a rather marked proptosis of the left eye and the presence of a small, hard, rounded, definitely localized mass, about 2 cm. in diameter, in the left inner canthus.

Laboratory examinations were essentially negative. Roentgenologic examination of the skull in the anteroposterior position showed some cloudiness in the right maxillary sinus. The left intraorbital foramen was considerably larger than the right foramen. The lateral view revealed an apparent hyperostosis of the vault, more prominent in the region of the frontal bone.

The tentative diagnosis of mucocele of the left frontal sinus, with probable extension of the ethmoid sinus, was confirmed at operation, at which the Lynch radical frontal operation was carried out under nitrous oxide ether anesthesia. When the periosteum was elevated a pyocele presented itself just medial to the left inner canthus and extending from the frontal sinus into the ethmoid labyrinth. It ruptured on the first manipulation and about 2 drams of pus was removed. Following excision of the sac the frontal sinus was curetted and the frontal process of the maxillary bone was trimmed sufficiently to permit a large rubber tube drain to be inserted through the nose up into the frontal sinus. Sulfanilamide was placed in the wound before closure.

CASE No. 2

A white boy, 11 years of age, began to complain of generalized headaches in the fall of 1942. Soon afterward swelling of the left upper lid was observed, and still later fixation of the left eyeball, associated with double vision. The boy was hospitalized for 14 days and was treated with one of the sulfa drugs. The headaches were completely relieved thereafter, and the swelling of the eyelid also disappeared, but it recurred every month or two, and was later associated with marked proptosis. The eyeball remained fixed. There was nothing of significance in the previous history except for frequent colds and asthma during the first two years of life.

The boy came under the attention of Dr. Gilbert C. Anderson in February, 1944, because it was suspected that a brain tumor was the cause of his symptoms. Dr. Clark was asked to see him in consultation because an orbital tumor was suspected, and still later I was called in consultation because a mucocele was suspected.

Physical examination was essentially negative at this time except for the ophthalmologic findings already described. Laboratory examinations were also essentially negative. Radiologic examination of the skull (figs. 1, 2) showed considerable en-

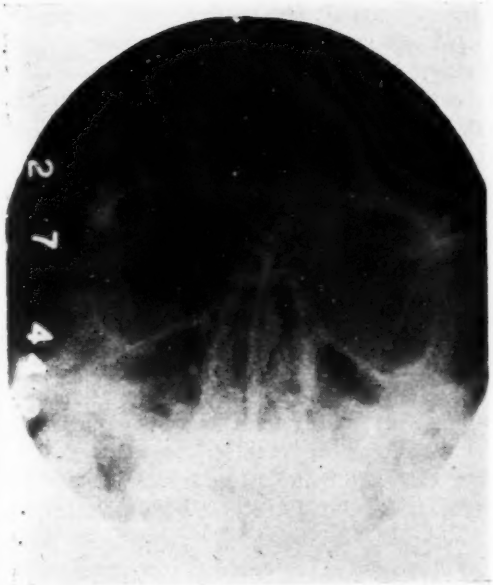

Fig. 1. Anteroposterior roentgenogram of sinuses in case of incipient mucocele (see text for detailed description).

Fig. 2. Anteroposterior roentgenogram of skull in case of incipient mucocele (see text for detailed description).

largement of the left sphenoidal fossa as a result of irregular erosion of the superomedial wall. The roentgenologist considered that this implied, in addition to destruction of the frontal bone near the apex of the orbital roof, a possible communication with the posterior ethmoid air cells. The left optic foramen was larger than the right. The left sphenoid and left ethmoid sinuses were hazy and the frontal sinuses were little pneumaticized. The other sinuses were apparently well aerated.

The roentgenologist did not regard the findings as definite enough for diagnosis, but suggested as possibilities meningioma with secondary involvement of the orbital apex, to be excluded by pneumography; tumor or granuloma of intraorbital origin; and a primary lesion of the posterior ethmoid labyrinth, which might be either a tumor or a mucocele.

Exploration under nitrous oxide ether anesthesia revealed no abnormality of the left frontal sinus. The ethmoid labyrinth in both the anterior and posterior portions was full of polypoid and granulation tissue. The Lynch radical frontal operation was carried out, as in the first case, the ethmoid space was thoroughly curetted, and the frontal process of the maxillary bone was partially removed, to permit the introduction of a large rubber tube for drainage. The pathologic report on the excised tissue was polypoid and chronic inflammatory tissue.

Recovery was smooth and the boy at present has no proptosis or other deformity. A possible allergic background was suspected in this case, because of the polypoid character of the contents of the ethmoid labyrinth, but a complete check from this standpoint has shown only insignificant reactions to all of the substances tested. Culture of the nasal secretion revealed *Staphylococcus aureus*, from which an autogenous vaccine was made, but it has been used too brief a time to permit any statement as to results.

COMMENT

The first of these cases was a clearcut instance of pyocele involving both the frontal and ethmoid sinuses. The second case I believe was an incipient mucocele, which has been aborted by correction of the circumstances which would have favored its further development. In each case it is to be assumed that the disease must have begun to develop for a considerable period of time before symptoms were manifest, though the youth of each patient necessarily limited the duration of the pathologic changes.

It should be emphasized that in each case the symptoms and findings were ex-

actly as stated, and that the physical findings were limited to the orbital cavity. There was no complaint of pain and tenderness above the eyebrow, no nasal discharge, and no auditory symptoms. Transillumination and other examinations furnished no diagnostic aid, and no etiologic factor could be demonstrated. The Lynch radical frontal operation permitted full exposure and adequate curettage of the affected spaces, and left no deformity, the scar in each case being minimal and evident only on close inspection. In each case the ophthalmologic status is now entirely normal.

DISCUSSION

Etiology: None of the theories of etiology advanced to explain mucocele and pyocele is applicable to all cases, and for that reason definitions which introduce specific or implied concepts of causation are improper. Logan Turner, for instance, defined mucocele as "a distension of one or more of the walls of the cavity, and an accumulation within it of a mucous secretion resulting from obstruction of its outlet." As will be pointed out later, the outlet was not obstructed in many of the reported cases, the secretion is not usually mucoid, and the train of events is accumulation of secretion followed by distention of the bony walls, rather than vice versa, as this definition would suggest.

The important theories of the etiology of mucocele may be summarized as follows:

1. Trauma: This theory is naturally not applicable to the cases (which include most of the reported cases) in which no history of trauma can be obtained. It is also possible that in some cases the physical evidence of mucocele was present and was ignored by the patient until some injury of the region called his attention to it. In one of the cases reported by Chamberlin and Parry,[11] for instance, the negro woman stated that a swelling in the internal canthus had been present before her injury, after which, however, it had become larger.

On the other hand, as Dabney pointed out, it is not unreasonable to assume that a blow over the internal angular process, in the region of the nasofrontal duct, might cause closure of the natural exit for secretions, particularly in young persons, whose sinuses are small and rudimentary and whose bones are easily bent. Howarth, who believed trauma to be responsible for four of his 14 cases, postulates a special configuration of the ethmoid cells, some of which, instead of being protected, as normally, by the ascending process of the superior maxilla, apparently lie much farther forward, in front of the lacrimal process.

Demaldent's patient (cited by Dabney) observed his mucocele only two days after he had dived six times into the Seine to rescue a drowning man, but in many cases the symptoms occurred so long after the injury that the correlation seems somewhat unrealistic.

2. Occlusion of the ostium of the sinus for various reasons, including trauma, as already mentioned; obstructive scar tissue from previous inflammations; congenital absence of communication between the nose and frontal sinus; and congenital narrowing of the duct, which would predispose to catarrhal inflammation and obstruction. The lumen, as already pointed out, is patent in many cases, but Turner is of the opinion that in such instances temporary closure of the ostium may previously have occurred and that later, after the lumen has again become patent, the retained secretions are too viscid for free drainage.

3. Cystic dilatation of a mucous gland or cystic degeneration of the mucosa. Dabney believed that he had proved this theory in one of his personal cases, and Johnson[12] stated that it can be confirmed by histologic examination. Lobell,[13] who believes that all mucoceles can be explained on this basis, advances the following arguments to support his position: (a) Mucocele is rare as compared with ostial occlusion from hypertrophy, hyperplasia, neoplasia, and polypoid changes. The latter changes, it will be remembered, were present in the second case I am reporting, and I believe would have gone on to continued degeneration if operation had not been performed. (b) A cystic mass is invariably found in the floor of the sinus, in the immediate vicinity of the ori-

fice of the nasofrontal duct, whenever an incipient mucocele is discovered by x-ray and the sinus is trephined. The author supplies no details, and the assumption is that this has been his personal experience. (c) The frequency, for anatomic reasons, of mucoceles in the frontal as compared to the maxillary sinuses. (d) The characteristic absence of pain in mucocele, as compared with the characteristic pain of ostial occlusion. Since the stage of occlusion, which is the terminal stage of mucocele, is preceded by degeneration of the mucosa, the explanation for the absence of pain is that the nerve terminals have lost their sensitivity for the perception of pain stimuli, as the result of the previous process.

4. Cavanaugh's[14] theory that mucoceles originate in misplaced ethmoid cells, which undergo pathologic changes as the result of vitamin or endocrine imbalance, has no other supporters so far as I know. The same author, again with no other apparent support, lists as possible predisposing agents dust, fumes, vapors, gases, and toxic substances.

Pathologic Changes: A mucocele resembles a cyst in its gross characteristics. Histologically, according to Johnson, it is a thin-walled sac made up of fibrous tissue with edema, and lined by low cuboidal or stratified columnar epithelium, in contrast to the normal pseudostratified ciliated columnar epithelium of the frontal sinus and ethmoid cells. Although the contained secretion may vary widely in its characteristics, most writers emphasize that it is thicker than the normal mucoid secretion of the sinuses, being tenacious or gelatinous, and difficult to remove. Dabney states that it comes away in "wormlike" masses. In Pimental's case (cited by Sallinger[15]) as in my own second case, it was polypoid in character. The color is variously described as yellow, amber, brown, gray, pinkish-gray, and red-streaked or black-streaked.

Bone changes vary from moderate to extreme in advanced cases. In early cases—the term early always being used relatively in this condition—they may be absent or slight, as in my own cases. Whatever may be the etiologic factors responsible for mucocele, the ultimate bony changes are of mechanical origin and are the result of pressure within a closed space. It is the *constancy* rather than the *degree* of the pressure which results in erosion and other bone changes, including rupture, if the pressure is not relieved by surgical measures. Relative enlargement of the affected cavity, as compared with the cavity on the opposite side, is one of the diagnostic criteria, and was observed in both cases which I am reporting. One of the walls, however, usually gives way before enlargement of the bony cavity becomes extreme.

Skillern observed that it is conceivable that continued secretion can cause bulging of the walls of the ethmoid and maxillary sinuses, which are very thin, but almost incredible that the anterior wall of the frontal sinus should give way for this reason. Paradoxical as it may seem, however, the weaker posterior wall seems to resist pressure better than the stronger anterior wall. The defect most usually occurs in the wall of the sinus overlying the orbit, after which the distending sac pushes itself into the upper medial orbit and displaces the globe. In a smaller number of cases the floor of the sinus remains intact and erosion and rupture occur posteriorly, with exposure of the dura, which sometimes is extensive.

External rupture sometimes occurs, as in Smith's[16] case, in which rupture of the left frontal sinus occurred through the upper eyelid two weeks before the patient sought medical advice. The anterior walls of both sinuses were removed at operation, which left nothing to sustain the underlying tissue, so that immediate cosmetic efforts were useless. In Moure's case (cited by Hajek) a mucocele of the ethmoid labyrinth grew to the size of a hen's egg, perforated the nasal septum, produced in a diastasis of the nasal bones, and projected like a hernia into the opposite sinus. In Dowman's[17] "giant" mucocele the enlargement of the right frontal region, including the supraorbital ridge, was 7 cm. transversely and 5 cm. vertically. In this case the posterior bony wall was replaced by pulsating

dura, and the supraorbital plate and inferior wall were respectively absent and replaced by intraorbital structures.

A pyocele differs from a mucocele only in that infection is introduced or is present from the onset; the pathologic process is otherwise the same. Bacteriologic examination of the contents of the usual mucocele is negative, but various organisms, including pneumococci, have been reported in pyoceles.

Clinical Picture and Diagnosis: Because of their slow growth and chronicity, mucoceles may not give rise to symptoms for long periods of time, and seldom give rise to severe symptoms. As a result, the patient frequently puts off medical consultation for long periods of time—15 to 18 years in some of the reported cases—and most frequently comes first to the ophthalmologist because his chief symptoms are related to the eye.

The most constant complaint is headache, usually frontal, varying from mild to severe. Other symptoms, as listed by Dabney, include a sense of weight, numbness in the top of the head, fulness of the cheeks, and a feeling that the two sides of the head are different. Epiphora is not infrequent. There is seldom a nasal discharge unless intranasal rupture has occurred, and examination of the nasal structures is usually negative. Constitutional symptoms, even if the mucocele is converted to a pyocele, are usually absent.

Mucoceles arising from the ethmoid labyrinth are located somewhat lower than the frontal variety, and sometimes displace the lacrimal apparatus, though the difference in location is so slight as usually to be of little diagnostic value. The displacement of the eyeball in early cases seems to be most pronounced when both the frontal and ethmoid sinuses are involved, as in the first case reported herewith, and least pronounced when only the ethmoid labyrinth is involved, as in the second case. In advanced cases the displacement may be so extreme that the eyeball is forced out of the socket; in Barthausen's classic case (cited by Skillern) the eyeball was dislocated almost below the nasal aperture. Since the mass is external to the orbital contents, movements of the eye are not usually affected. Diplopia may be an early symptom, as in my second case, as the result of slight alteration of the visual axis due to displacement of the contents of the orbit, but is usually a later symptom. Serious impairment of vision is the rule in neglected cases. Edema of the eyelid, which feels stiff on palpation, is frequently associated with proptosis.

Diagnosis is made tentatively on the basis of the history and physical findings, supplemented by roentgenologic examination, which is usually diagnostic, particularly in late cases. The radiologic changes, as outlined by Hartung and Wachowski,[18] include variations in the density of the sinuses and abnormalities of the contour and structure of the sinal walls, depending upon the size, shape and location of the mucocele and the extent to which it has produced pressure changes in the form of erosion, displacement, or reactionary changes in the surrounding structures.

In cases without bone erosion the roentgenologic changes are similar to those found in the ordinary retention cyst. When bony changes have occurred, however, the picture is characteristic. The gross outline of the affected sinus is usually slightly larger than on the other side, and the density over the sinus is decreased. The borders lose their septate or scalloped appearance. The marginal densities become rarified, smooth and regular, this being perhaps the most characteristic finding. If distention has been rapid, the border may show roughening and areas of bony deficiency. The orbital roof may be flattened and pushed down, and may present a defect. The ethmoidal cells may be encroached upon, and lateral exposure may reveal considerable unsuspected encroachment upon the anterior cranial fossa. If the process has been slow, there may be areas of increased density along the margins or superimposed upon the sinus cavity, which represent reactionary bone formation.

Shadows may be so dense as to suggest osteomata. Changes indicating increased radiopacity are usually of greater diagnostic value than those of increased density, which are suggestive of mucocele only when accompanied by secondary changes in surrounding structures or when localized within the sinus. Lateral and sagittal exposures are useful in ruling out shadows due to anomalous configurations of the sinuses or abnormalities of neoplastic origin. Lipiodol injection also may be useful.

Hartung and Wachowski provide an excellent discussion of differential diagnosis, which includes chiefly dermoid cysts, meningocele, osteoma and fibrosarcoma. The thirty-six possible conditions which must be differentiated according to Lederer[19] are for the most part unimportant. Dermoid cysts and meningoceles, both of which are congenital, usually occur in the midline. Osteoma and fibrosarcoma can be distinguished from mucocele by the fluctuant consistency of the latter, which can be demonstrated by cautious aspiration if necessary. The monocular character of the proptosis excludes Graves' disease. The clinical differentiation between mucoceles of the frontal and the ethmoid sinus is usually impossible.

Therapy: Therapeutic measures are imperative, no matter how early the condition is recognized, to prevent subsequent osseous and tissue deformity, orbital changes, and irreparable damage to the sight, which has occurred in some of the recorded cases. Furthermore, while the disease is ordinarily mild and recovery after operation smooth, this is not always true, particularly in late cases. Luc (cited by Dabney) discovered, after he had almost completed the operation for mucocele, that his patient also had meningitis and a brain abscess. Johnson's patient, whose interfrontal partition had been eroded away by the pathologic process, developed septicemia and meningitis after operation, type XXVIII pneumococci being isolated from the contents of the mucocele, the blood stream, and the spinal fluid.

The subject of treatment is the removal of the mucocele and the institution of adequate drainage. This was formerly achieved by the Killian or the Luc-Caldwell operation, but is now accomplished, with greater ease and without deformity, by the Lynch radical frontal operation. An intranasal operation is occasionally adequate when only the ethmoid labyrinth is involved, but usually some external procedure is necessary.

If the exophthalmos has become so marked that regression does not occur after correction of the sinal disease, it should be treated later by the Naffziger or the Sewall operation. Plastic surgery may be necessary after the primary operation in advanced cases in which external rupture and extensive bone destruction have occurred.

SUMMARY

1. Mucocele (pyocele) is not rare but is still sufficiently uncommon to warrant the record of additional cases, two of which, including one incipient case, are reported herewith. Both occurred in children.

2. No theory of etiology is applicable to all cases, and no etiologic factor was apparent in these two cases. Trauma, occlusion of the ostium of the sinus for various reasons, and cystic dilatation of a mucous gland or cystic degeneration of the mucosa are the most important probable causes.

3. Orbital changes, the most striking of which is proptosis, are the outstanding findings in mucocele and pyocele, and are the result of distention of the sinal spaces. Eone changes in late cases may be very destructure, and external rupture is a possibility. In the reported cases, both of which were early, orbital changes were notable but bone changes were minimal. The constancy of the pressure within the sinus, rather than the degree, is the background of the pathology.

4. Symptoms related to the eye are the most important phase of the clinical picture of mucocele, and physical examination, except in very advanced cases, is usually negative except for the orbital findings. Diagnosis is made on the clinical picture and is confirmed by the radiologic findings.

5. Therapy should be instituted as soon as the diagnosis is made, to prevent later

bony and tissue deformity, which may be extensive, and orbital changes, which may result in serious impairment of vision. The Lynch radical frontal operation accomplishes adequate drainage with minimal scarring. It was used in both the reported cases. Surgical correction of permanent exophthalmos may be necessary in neglected cases, and secondary plastic procedures must be employed if extensive bony destruction has occurred.

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DISCUSSION

Dr. Shelly R. Gaines (New Orleans): The first case, R. D., was seen by me on February 7, 1942. At that time the vision in the right eye was 20/25 and the vision in the left eye was 20/25. The vision in the left eye could not be improved with glasses. Upon examination of the left eye there was edema of the upper lid, proptosis of the globe of 4 mm. A palpable firm mass could be demonstrated along the inner upper rim of the orbit. The fundus examination showed two diopters of papilledema with marked engorgement of the veins. When seen on April 12, 1944, the vision was right 20/20; left eye 20/20; accommodation 12.00 diopters in both eyes. A PCB of 5½ cm. was presented. The proptosis was reduced to less than 1 mm. The ptosis was almost gone and engorgement of the veins was much less and the swelling the upper lid had disappeared.

The second case when first seen had a vision of 20/20 in each eye. The patient was near sighted. The vision was corrected with glasses to normal. There was a slight edema of the affected eyelid and the globe was visibly displaced laterally. There was 3 mm. proptosis. A smooth firm mass was palpated along the inner and upper orbital rim. No fundus changes were present. On November 24, 1943 the edema of the lid was much improved. The lateral displacement of the globe was practically gone and the proptosis was much less.

Dr. Gilbert C. Anderson (New Orleans): This excellent report emphasizes the interest and importance of rare and unusual conditions. The patient was an exceptionally strong and well built boy of 12 who was active in athletics, specializing in football, and to this football playing his mother attributed all of his trouble. He had been having intermittent attacks for about two years all pretty much alike and characterized by severe headache with nausea and vomiting; the tissue about the eye would swell markedly but this swelling was within the limits of the bony orbit and mostly in the upper lid. There was very little swelling about the periphery of the orbit. After a short time there would occur a discharge of a large amount of bloody mucoid material from the left nostril and the attack would clear up, only to return at a later date. Tentative diagnoses at home were brain abscess and recurring hematoma. On examination I found no evidence of increase in the intracranial pressure and no neurologic signs of a localizing nature. I therefore thought of a neoplasm or inflammatory condition within the orbit and roentenograms showed the changes described by the essayist. I found this case to be of unusual interest in its development and very gratifying in its outcome.

Dr. L. W. Alexander (in closing): I think one of the things that these cases bring out is that we should be on the lookout for them and when they are found realize that they are worth while going

into and exploring because if you do not you are going to get some tissue deformities and considerable loss of vision if not taken early. If taken early I think we can save tissue deformity and vision in these cases.

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ROCKY MOUNTAIN SPOTTED FEVER

DIFFERENTIATION FROM TYPHUS FEVER AND REPORT OF CASE

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In the ten years intervening from January 1, 1934, to December 31, 1943, a total of 145 cases of endemic (murine) typhus fever were observed in the Charity Hospital of Louisiana at New Orleans. Thus typhus fever is seen sufficiently often in Louisiana to warrant consideration in the differential diagnosis of all acute infectious diseases accompanied by a rash. Rocky Mountain spotted fever, on the other hand, is rarely entertained in the diagnostic possibilities. The purpose of this paper is to present a report of the first case of Rocky Mountain spotted fever diagnosed at the Charity Hospital, and to describe the diagnostic aspects of spotted fever as compared to typhus fever.

An eastern type of Rocky Mountain spotted fever was first identified in 1931 by Badger, Dyer and Rumreich.[1] Subsequent studies of this disease show it to be clinically indistinguishable from the western variety. There are, however, differences in transmission of the two types. The western form of Rocky Mountain spotted fever is conveyed to man by attachment and engorgement of the wood tick, *Dermacentor andersoni*, whereas most cases in the eastern and southeastern states are transmitted by the dog tick, *Dermacentor variabilis*. There is some evidence that the rabbit tick, *Dermacentor parumapestus*, is infected with a virus of low virulence and since the rabbit tick is distributed widely, may conceivably serve as a source of infection. In nature *Haemaphysalis leporis-palustris* is an important vector for rabbits. Investigations in the Gulf Coast area in Texas[2] indicate the possibility of other ticks as vectors for Rocky Mountain spotted fever in this area. There are infections present in other ticks, but to date they have not assumed epidemiologic importance. No information has been definitely established concerning the percentage of ticks infected in the eastern and southeastern states. Random studies[3] throughout United States permit the conclusion that only 1 per cent of ticks are infected in most areas, although in certain localities and at certain times the percentage of ticks infected may be as much as 11 per cent. Thus, Rocky Mountain spotted fever is essentially a rural disease and occurs during the period of greatest tick activity, that is spring and summer. Endemic (murine) typhus fever, being transmitted chiefly by the rat flea, *Xenopsylla cheopis*, is most prevalent during the summer and fall. The greatest incidence of endemic typhus occurs in those persons frequenting rat-infested habitations, hence is often seen in those handling foodstuffs.

The history of a recent bite by a tick or crushing of a tick is oftentimes of considerable diagnostic significance in Rocky Mountain spotted fever. The etiologic agent, *Dermacentroxenus rickettsii*, gains entrance to the body by direct injection from the salivary glands of the tick during the process of feeding. Occasionally, contamination of the fingers by infected viscera of crushed ticks may lead to a gastrointestinal route of infection. Ample evidence suggests that the rickettsiae of both Rocky Mountain spotted fever and typhus fever may penetrate the unbroken skin and a few cases have been ascribed to a conjunctival infection.

The etiologic agent of Rocky Mountain spotted fever, *Dermacentroxenus rickettsii*, is morphologically similar to that causing typhus fever, *Rickettsia prowazeki. D. rickettsii*, however, possesses the unique prop-

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erty of invading nuclear substance whereas *R. prowazeki* grows massively in the cytoplasm but does not invade the nuclei. Smears from the scrotal sacs of infected guinea pigs and tissue cultures may enable the pathologist to demonstrate these changes. In such instances the rickettsiae of spotted fever are fewer and larger. Considerable experience is required for such differentiation.

The pathologic changes induced by the two organisms are essentially the same, being described as an acute endangiitis of the small blood vessels throughout the body, particularly in the brain and skin. There is, however, in Rocky Mountain spotted fever usually a more severe lesion in the vessels and a greater enlargement of the spleen as compared to typhus, as well as a greater tendency to gangrene. In spotted fever, the rickettsiae invade the smooth muscles of the media of the blood vessels, in typhus the endothelium. Hence, thrombotic lesions in spotted fever are generally more severe than in typhus fever, and necrosis of fingers, toes, face, ears, scrotum and vulva may occur.

The clinical picture of Rocky Mountain spotted fever is remarkably similar to that of endemic (murine) typhus commonly seen in this locality. Perhaps the most outstanding clinical difference is the character of the rash. The rash of spotted fever appears earlier in the illness, often within 24 to 48 hours after the onset, than that of typhus fever, and is usually more hemorrhagic and purpuric in nature. At times a macular, rose-colored eruption may precede it. The rash of spotted fever tends to appear first on the back, wrist and ankles, with early involvement of the palms of the hands and soles of the feet. Later the forehead, arms, legs, chest and abdomen are affected. The spread takes two to three days. In endemic typhus the rash usually appears first on the chest and upper abdomen, and involvement of the face, wrists, ankles, palms and soles rarely occurs. Both the rash and other clinical features of the two diseases in individual patients may be so varied that clinical differentiation by these means usually is fraught with difficulty. Neither the nature of the lesions nor their localization can be relied on absolutely for differentiation. Moreover, the exanthem of the two diseases may be confused readily with those seen in sulfonamide dermatitis, streptococcic septicemia, cerebrospinal spotted fever, measles and toxoplasmosis.

When Rocky Mountain spotted fever was believed to be confined to the western United States, geographic distribution was used to differentiate these diseases. However, demonstration that these diseases may both be present in many parts of the world, including the south and southeastern United States, has removed geography as a differential diagnostic tool. Clinical characteristics which are commonly given as differential points often fall down because of the variability of the clinical picture. History of tick bite when obtained is helpful. The time of onset and distribution of the rash has already been mentioned. Length of febrile course is another feature. In the Gulf states, typhus fever commonly runs a 14 or 16 day febrile course, but we have occasionally seen patients febrile for 19-20 days, a period more common in spotted fever. Brain lesions occur in both and the scrotal reaction may also.

Definite differentiation of Rocky Mountain spotted fever and typhus fever was first shown in 1910 in cross-immunity experiments by Ricketts and Wilder. The differentiation must still be effected chiefly by laboratory means. Of first importance in the diagnosis of either disease is the Weil-Felix reaction. In general, agglutinins in spotted fever are usually in low titer for all three strains of *Bacillus proteus*, whereas the principal agglutinins for typhus fever are for OX-19. In the mild strains of both diseases with which we deal in the Gulf states these criteria are often unreliable as we have observed in two instances occurring in Louisiana but not herein reported. Hence differentiation by the Weil-Felix reaction alone should not be made. The lowest titer of diagnostic importance is 1:160, but a rising titer during the course of the disease is of even greater significance. Agglu-

tinins are usually present by the end of the first week but may not appear until convalescence. Repeated observations should, therefore, be made.

In experienced hands, biopsies of the skin are valuable diagnostic procedures. A clearly demarcated, macular lesion should be excised widely, fixed in Regaud's fluid, and stained by the Giemsa method.[3] In typhus, rickettsiae will be found only in endothelial cells, whereas in Rocky Mountain spotted fever the rickettsiae will be found in the smooth muscle cells of the arteriolar walls. This finding is diagnostic but rickettsiae are not always found in the specimen.

In doubtful cases, inoculation of male guinea pigs and male white rats may be necessary. Here cross immunity tests may be done. Three to 6 c. c., preferably the latter, of blood drawn from the patient during the first week of the disease is injected intraperitoneally into each of several guinea pigs and rats. An incubation period of four to twelve days should elapse. The febrile course is watched. Scrotal reactions in either animal with the development of a heavy exudate with abundance of rickettsiae are typical of endemic typhus. In the rat it is conclusive. As stated in an earlier paragraph concerning etiology, smears of scrotal cells in typhus reveal massive growth of the rickettsiae in the cytoplasm with no invasion of the nuclei. In Rocky Mountain spotted fever in the scrotal reaction, such smears reveal few, large, widely disseminated rickettsiae in the cytoplasm. If the animals do not react sufficiently, cross immunity tests with known strains of typhus fever and spotted fever will usually complete the diagnosis. In some mild atypical strains, the results of these tests may not be decisive. Here, tissue cultures may be helpful; the extensive intranuclear growth in spotted fever is clearly seen, while the typhus organisms grow extensively in the cytoplasm.

In instances in which the blood was taken too late in the disease (after the sixth day), or the animal inoculations fail, protection tests may be carried out. The serum from a convalescent patient is infected with known strains of typhus fever and Rocky Mountain spotted fever and injected intraperitoneally into guinea pigs, using controls. If immunity to either disease has developed in the convalescent patient, the guinea pig inoculated with that particular virus will be protected from severe reaction.

Since animal experimentation does not lend itself well to clinical practice, other simpler methods are desirable. Bengtson and Topping[4] have recently devised a specific complement fixation test for the recognition of typhus fever, the antigen consisting of rickettsiae grown in the yolk sac of chick embryos. A similar complement fixation test for Rocky Mountain spotted fever has been reported by Plotz and Wertman.[5] In a personal communication to the authors, Bengtson[6] stated that cross reactions had been noted between the strains of Rocky Mountain spotted fever and endemic (murine) typhus of the South. More work is needed to clarify this point.

The following case report of Rocky Mountain spotted fever will depict the clinical picture and emphasize its similarity to that of endemic (murine) typhus fever.

CASE REPORT

J. M., a 50 year old, white male, an inmate of the State Penitentiary at Angola, Louisiana, was referred to Charity Hospital on August 1, 1944, complaining of symptoms of two weeks' duration, during which time he had chills and fever up to 104° F., profuse sweating, malaise, muscle and joint pains, cough, pain in the epigastrium and chest pain which was aggravated by inspiration. He is believed to have been delirious for a large portion of that time. The patient had been permitted to do outdoor work at the penitentiary such as working in the pumping station previous to this illness. On admission, his temperature was 100.4° F., pulse 102, respirations 30 per minute, blood pressure was 115/80. He appeared weak, exhausted and acutely ill, but his sensorium was clear. Examination of the skin revealed small vesicles and purplish, erythematous lesions on the posterior and lateral aspects of the neck, abdomen and extremities. These lesions were not numerous or confluent. Petechiae on the lower extremities were numerous. No lymphadenopathy could be demonstrated. The remainder of the physical examination revealed no deviations from normal, that is, there were no evidences of bronchitis, splenic en-

largement, dicrotic pulse, cardiac gallop rhythm, or nervous system findings such as may occasionally be seen in acute infectious diseases. A Rumpel-Leede's test was negative. The hematologic study revealed 10 gm. of hemoglobin (Sahli), 3,050,000 red cells, 4,250 white blood cells, and 83,725 platelets. The differential count disclosed 54 per cent polymorphonuclear leukocytes, 32 per cent lymphocytes, 10 per cent immature cells, and 4 per cent monocytes. No malarial parasites were found. Urinalysis was normal, as were blood chemical studies. Kline and Kolmer tests were weakly positive. Three consecutive blood cultures on alternate days were negative. Cultures and smears of the stools were negative for any pathogenic organisms. Agglutinations of serum on August 4, three days after admission, were negative for *E. typhi*, paratyphi B, *Br. melitensis*, *Br. abortus*, and *B. proteus* X-19. These were repeated on August 7, and were found positive for *B. proteus* X-19 in 1:320 dilution.

The patient's condition in the hospital improved steadily. Therapy consisted entirely of supportive and symptomatic measures. For the first seven days, he manifested an intermittent, daily, afternoon rise of temperature to 100.8° F. which subsided at the end of the first week in the hospital (at the end of the third week of illness). His pulse did not rise above 100 at any time throughout his hospital course. The rash faded gradually and on August 14, it was no longer discernible. He remained afebrile for two subsequent weeks of hospitalization, improved rapidly in strength and well-being, and was discharged on August 21, 1944.

On the day of discharge from the hospital, samples of his blood were forwarded to the National Institute of Health, Bethesda, Maryland, for further study. Complement fixation test was positive for Rocky Mountain spotted fever in a dilution of 1:2048. There was a slight fixation (1+) for endemic typhus in dilutions 1:4 to 1:512. This was interpreted as negative. Agglutination tests were positive in a dilution of 1:1280 to *B. proteus* X-19, and negative for *B. tularense*, *Br. abortus*, *B. typhosus*, and *B. paratyphosus A* and *B*, *B. dysenteriae Shiga*, *B. dysenteriae Flexner*, *Leptospira icterohemorrhagiae* (Weil's disease) and *Leptospira canicola*.

SUMMARY

A report of the first case of Rocky Mountain spotted fever diagnosed at the Charity Hospital has been presented. In the individual patient, the clinical picture is indistinguishable from that commonly seen in endemic (murine) typhus fever, hence the diagnosis must be based on laboratory evidence as the specific complement fixation test, skin biopsies, animal inoculations and cross immunity tests, and protection tests. In certain cases, the diagnosis becomes exceedingly difficult and requires technical skill not readily available in most communities. If Rocky Mountain spotted fever is considered in the differential diagnosis of all acute infectious diseases, particularly those with exanthematous manifestations, and specimens of blood sent to diagnostic centers for study, it is not unlikely that more instances of this disease will be found.

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FOOD POISONING*

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NEW ORLEANS

The term food poisoning is used to describe an acute gastroenteritis following the eating of contaminated food. Outbreaks may involve anywhere from a few to a hundred or more victims. Many small outbreaks of slight severity go unreported, or are improperly diagnosed ptomaine poisoning. This is a misnomer introduced by Selmi,[3] the Italian toxicologist, in 1870. It is taken from the word "ptoma" which means corpse. Ptomaines, ammonia substitution compounds, are simply the result of decomposition of the protein molecule and are produced by any bacteria which can bring about this degree of proteolysis. A

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few of the ptomaines are physiologically active. If injected parenterally, some are poisonous. Administered orally, even in relatively large amounts, the more poisonous ones are not toxic nor do they produce gastrointestinal symptoms.[8]

There is a popular tendency to associate food poisoning with putrefaction. It is known that putrefaction of a food does not give rise to toxic substances involved in food poisoning. There are some wholesome foods dependent upon putrefactive bacteria for their flavor and taste, such as limberger cheese, and the process involved may be considered essentially commercially controlled putrefaction. However, even in such products, food poisoning bacteria or chemicals may be present and produce typical symptoms of specific gastroenteritis. When large numbers of persons are affected, particularly if they have attended a banquet or eaten in some public establishment, considerable publicity is often given the episode by the press and thorough investigation is made by public health authorities.

The causes of food poisoning may be divided into three groups: (1) chemicals and drugs; (2) poisonous plants and animals; (3) bacteria and their products.[3] Individual food idiosyncracy might be added to this classification for clinical purposes.

Gastrointestinal upsets may be due to such chemical poisons as antimony, arsenic, lead, cadmium, fluoride (especially sodium fluoride), methyl chloride, mercury, zinc, and many others. Chemical poisons have often been mistaken for medicine, baking powder and starch. An example of this recently occurred in one of our large state institutions. One night 14 inmates became desperately ill, one of them dying. Food poisoning was immediately suspected because of the explosive character of the outbreak, and many samples of food found in the kitchen were submitted for examination. Within a few hours, sodium fluoride was found in one of the biscuits. The stomach of the dead woman contained the same poison. Samples of white powder in an unlabelled jar were found to be roach poison containing sodium fluoride. Immediately upon obtaining this information, the physican at the institution was notified. Subsequent investigation revealed that a new cook, during preparation of her first meal, mistook the roach poison for baking powder and used it in the biscuits. Many smilar examples might be cited.

Cases due to poisonous plants and animals include shellfish, mushroom, milk sickness or snake-root poisoning, ergotism, water hemlock poisoning and the like.

Since cases of food poisoning due to bacteria or their products are the most common, the organisms responsible for such cases and their effect upon man will be more fully discussed.

There are four types of bacteria definitely known to cause food poisoning in man, namely: staphylococci, Salmonella, *C. botulinum*, and streptococci.[13] Outbreaks have been reported due to *Bacterium coli* and the Proteus group, but proof that these microorganisms are the causative agent is inconclusive.

STAPHYLOCOCCI

Staphylococci are responsible for 90 per cent of the outbreaks. This organism is widespread in nature and found normally in the nose, throat, and skin of healthy individuals, but not all are capable of producing food poisoning. Only those strains capable of producing enterotoxic substances when grown in suitable medium are the offenders—strains of *S. aureus* and occasionally *S. albus*.

The findings of these organisms in the incriminated food or vomitus raises the question of a possible etiologic agent, but does not establish a diagnosis. The isolated strains must be proved to be capable of producing enterotoxin.

There are few satisfactory criteria, at the present time, for the differentiation of the enterotoxin and non-enterotoxin producing strains. Stone[10] has claimed that food-poisoning strains could be distinguished by the liquefaction of a special gelatin medium. Chapman, Leib, and Crucio[2] suggested the use of certain *in vitro* reactions for the identification of food-posoning strains, such as

hemolysin production, mannitol fermentation, growth on brom-thymol blue agar, liquefaction of gelatin by Stone's method, and the coagulation of human and rabbit plasma. Positive results in all these were considered presumptive evidence. However, there seems to be no evidnce of homogeneity in strains studied by many laboratory workers. In a number of outbreaks studied by Stone,[11] 83.5 per cent produced pigment, 77.1 per cent were hemolytic, 88.0 per cent produced a characteristic reaction on Stone's gelatin agar, 74.2 per cent coagulated plasma, and 93.6 per cent fermented mannite.

The most reliable method of testing the production of enterotoxin by staphylococci is the feeding or injecton of the filtrate into experimental animals. In earlier studies, it was necessary to feed filtrates to human volunteers. This is hazardous and unreliable, and as a routine laboratory test, impossible. Monkeys have also been used, but obtaining and handling are difficult, and experimental work done by Dack, Shaughnessy and Grubb[6] has shown that they do not react consistently to the toxic filtrate. Results obtained from the use of small laboratory animals are not very satisfactory. Dolman[4] and his coworkers have found that filtrates injected intraperitoneally produce a typical syndrome in six to eight week old kittens weighing 350 to 550 grams. The intravenous injection of filtrates into adult cats has also been satisfactory.

The enterotoxin type of staphylococcus food poisoning is characterized by symptoms of nausea, vomiting, diarrhea, and acute prostration within a half to six hours after eating. The morbidity rate is usually very high, with 75 to 100 per cent of the persons who eat the food being attacked. The patient appears acutely ill and symptoms are severe while they last, but recovery is rapid and usually complete within 48 hours.

SALMONELLA

The next most common type is Salmonella food poisoning. This type is often referred to as the "infection type" and is due to the multiplication within the body of pathogenic bacteria present in food. Those most frequently isolated are *S. typhimurium* and *S. enteritidis*, but many other species of the group have been identified as the causative agent in outbreaks all over the world. Salmonella food poisoning is apparently more prevalent in Europe than in North America. Unlike staphylococcus food poisoning, the bacillus does not produce a toxin, but the bacteria themselves produce the infection.

The isolation and identification of strains of Salmonella organisms by biochemic and serologic means from food, excreta, and vomitus, and the finding of agglutinins in the blood of patients after infection generally establishes the etiologic agent. It is not necessary to resort to animal inoculation.

In this type of food poisoning, symptoms generally appear in 10 to 12 hours and are nausea, vomiting, diarrhea, prostration, abdominal pain and fever. The morbidity rate is high, but the case fatality rate low. The patient is usually ill for a longer period of time than in cases of staphylococcus food poisoning.

C. BOTULINUM

The most fatal type of food poisoning is due to *Clostridium botulinus*. This organism is an anaerobic spore-bearing bacillus, capable of producing a highly potent toxin, is very heat resistant and likely to be present in canned food, especially home canned products. However, the toxin may be destroyed by heating to 80°C. for 30 minutes. Contaminated cans are usually puffed and the food shows evidence of decomposition; whereas with organisms of the staphylococcus and Salmonella groups, there is no change in appearance, taste or odor.

Toxin produced by this organism gives rise to clinically severe disease which is often fatal and gastrointestinal symptoms may occur early in the disease. It is a neurotoxin and produces characteristic symptoms such as double vision, difficulty in swallowing, and finally paralysis of the pharyngeal muscles. The incubation period ranges from a few hours to a few days. The

case fatality rate is high, depending upon the amount of toxin ingested.

STREPTOCOCCI

Streptococcus viridans has been proved to be the cause of several food-poisoning outbreaks. The organism does not produce a toxin, but, likes the Salmonella group, produces infection.

The incubation period is from five to 18 hours and symptoms are abdominal pain, nausea, vomiting, diarrhea, and prostration. There are no reported fatalities from this type of food poisoning.

The causes of gastroenteritis are numerous, and not all cases characterized by sudden onset of intense nausea, vomiting, and diarrhea are food poisoning. Certain infections are characterized by nausea and vomiting, and frequently require differential diagnosis from food poisoning. Outbreaks of this type are often explosive in nature and the first impulse on the part of the public is to blame milk, water or some food. They are, however, easily distinguishable from food-poisoning outbreaks, as new cases arise from day to day, and frequently infants on diets of boiled water and milk are attacked. In a recent epidemic of this type practically every type of food sent to the laboratory for examination revealed no etiologic agent. It is believed that such epidemics are due to a virus and that spread of the disease is by way of the respiratory tract.

It is of prime importance that as soon as food poisoning is suspected, health authorities be immediately notified so that investigation to determine the cause may begin. Delay may result in contamination or disposal of the remaining food. If all the food has been consumed or discarded, it is necessary to obtain vomitus, excreta, or both from the affected individuals. In the infection type, samples of blood may be collected later, as the presence of agglutinins is considered evidence of infection. However, this does not give absolute proof, for agglutinins may be present in the blood as a result of previous infection.

The Division of Laboratories of the Department of Health, State of Louisiana and City of New Orleans, had the opportunity to study outbreaks of gastroenteritis, many of which proved to be due to food poisoning. Several of the major outbreaks due to bacteria which occurred in 1942 and 1943 are of interest.

On January 1, 1942, a large family group ate dinner in a private home and all but seven of them became ill with symptoms of acute gastroenteritis from one to five hours after the meal. They were taken to a hospital where a tentative diagnosis of food poisoning was made. The following morning the Health Department was notified of the outbreak and investigation begun.

It was learned that the dinner had been a community affair, each member preparing a dish and bringing it to the gathering. Samples of the food remaining, chicken salad, gumbo, turkey, cranberries, pumpkin and apple pie, were collected and brought to the laboratory for examination. Epidemiologic investigation revealed that all of the persons who were ill had eaten the chicken salad. It had been prepared in the morning and was allowed to remain at room temperature until consumed that evening.

Staphylococcus was found to be abundantly present in the samples of the chicken salad. Further laboratory procedures proved them capable of producing an enterotoxic substance and therefore the causative agent in the outbreak. All the other foods were negative for organisms of the food-posoning group.

On March 23, 1942, an outbreak of gastroenteritis, suggestive of food poisoning, was reported to the Iberia Parish Health Unit, New Iberia, Louisiana. At the time, 13 persons were ill, all suffering from gastroenteritis with varying degrees of severity. Most of the patients were too ill to discuss the possible source of infection, but information gathered from relatives and friends revealed that all of them had eaten pork sausage.

The State Health Department was notified and the epidemiologist and others went to New Iberia to conduct an investigation. On March 21, 1942, a resident of New Iberia had received a package of unrefrig-

erated pork sausage from a friend in Texas. About two pounds of the sausage were given to a friend and some of it taken to a nearby restaurant where it was fried and served to a party of five. Later the proprietor broiled a small portion of the sausage and ate it. The two pounds given to a friend were fried by his wife and eaten by them for supper. The remaining portion was prepared in the form of a loaf and served to a family of six the following day.

All the persons who ate the sausage, with the exception of the proprietor of the restaurant, became ill four to 24 hours later. They all had similar symptoms, nausea, abdominal pain, diarrhea, chills and fever. The acute symptoms subsided in three to five days and all recovered.

The remaining uncooked sausage was sent to the laboratory for bacteriologic examination and an organism belonging to the Salmonella group was isolated. A culture of the organism was sent to the U. S. Salmonella Institute at the University of Kentucky for confirmation and classified as *S. berta*.

Stool specimens were collected from the patients during the acute stage of the disease. *S. berta*, the same organism isolated from the sausage, was recovered from eight of the stool specimens collected. To complete the investigation, samples of blood were collected from the patients about one month after the outbreak. Four samples were collected and of these, three showed the presence of specific agglutinins of *S. berta*.

The isolation of *S. berta* from the sausage and feces is most interesting, since this organism previously had not been reported in the United States. It was originally isolated by Hormaeche and Salsamendi[7] from the mesenteric lymph glands of normal hogs in Montevideo, Uruguay.

On March 24, 1942, an outbreak of food poisoning occurred in New Iberia, involving nine persons who had eaten home made ice cream. All became ill, with chills, fever, nausea, vomiting, and diarrhea, which persisted for several days. The majority had very watery stools with a noticeable amount of blood. None of the ice cream was available for bacteriologic examination, but *Salmonella typhimurium* was isolated from specimens of stool from all the cases.

On Sunday, April 26, 1942, a large group of residents in the Metairie area became acutely ill, with symptoms suggestive of food poisoning. Many of them were treated at hospitals while others were treated at home. Investigation revealed that all of the victims had eaten confections prepared at the same bakery. The following morning, samples of the confections were collected from the homes of several of the victims and from the bakery, and submitted for examination. They consisted of jelly doughnuts, cream-filled doughnuts, round doughnuts, breakfast cakes, cream puffs, lemon meringue pie, chocolate cream pie, vanilla cream pie, quart bottles of milk, meringue mix, a bag of corn starch, and a bag of powdered sugar.

Cultural examination revealed hemolytic *Staphylococcus aureus* in abundance in the specimens of cream doughnuts collected from the houses of several of the victims and from the bakery, and in the cream puffs obtained from the bakery. Cultural and animal studies confirmed these organisms as belonging to the food-poisoning group. All of the other confections were negative for such organisms.

A thorough inspection of the bakery was made by the Jefferson Parish Health Unit. The employees of the bakery were examined, and nose, throat and skin cultures taken. A culture from a furuncle of the finger of one of the employees showed *Staphylococcus aureus* of the food-poisoning type.

On July 28, 1943, an outbreak of food poisoning similar to the Jefferson outbreak occurred in New Orleans. It was caused by contamination of cream-filled pies with hemolytic *Staphylococcus aureus* of the food-poisoning type. Examination of nose and throat cultures, and culture from pustular lesions of several employees were made. Culture from a lesion on the wrist

of one of the employees showed the presence of hemolytic *Staphylococcus aureus.*

The type of food causing an outbreak must be taken into consideration, since work on the epidemiology of food poisoning shows that certain foods may be considered "vulnerable" to contamination. Infection may come from: (1) the animal itself; if the animal is so contaminated, the whole carcass may be infected, in which case there will be widespread incidence of food poisoning; (2) from food handlers who are carriers, or (3) from fouling by vermin such as rats and mice of food improperly stored.[1]

In Salmonella infection, fresh meat, milk and milk products, fish, poultry, and made-up dishes are the commonest vehicles of infection.[9] The foods associated with staphylococci outbreaks are usually meat or meat products, milk products, more especially cream or custard filled pastries.[12] Botulism generally results from home canned foods. Stone reports that of 96 outbreaks in which the enterotoxin producing staphylococci were involved, 43 per cent were due to cream or custard filled pastry, 35 per cent meat and products of meat, 19 per cent to dairy products, 2 per cent to potato salad, and 1 per cent to moldy syrup.[11]

The method used in introducing custard into eclairs, pies or cake confections may be responsible for the prominence of this group as a cause. The operator uses a canvas pastry bag which is intimately handled and he may have an infection on his hands, or the bag may not have been properly sterilized before use. The cream-filled pastries are then allowed to remain at room temperature where bacterial multiplication and toxin production occur. Immediate consumption of cream-filled pastries or refrigeration of such foods at a temperature that inhibits growth is recommended. Gilcreas and Coleman[5] have shown that rebaking of cream-filled pastries after filling at 216° F. for fifteen minutes will destroy any organisms without materially affecting the pastry. Others have added harmless chemicals which inhibit bacterial growth without altering the taste. Many bakeries restrict the preparation of cream-filled pastries to the winter months.

Food which, when prepared and consumed immediately, is satisfactory, but may upon standing at room temperature become harmful. In many outbreaks the food sold shortly after manufacture causes no illness, while that sold after standing several hours at room temperature causes severe attacks of food poisoning. In other cases, food manipulated during preparation or handled subsequently has allowed organisms to gain access and multiply. Many restaurant proprietors have found it cheaper to destroy perishable foods not consumed at one meal than to take the chance of holding them over for another meal. This is especially true of meats and made-up dishes that require handling.

As the war continues, the problem of bacterial food poisoning is likely to increase as a result of food shortages and food rationing. As a consequence of food scarcity, edibles will be made to last over a period of time and the serving of left-over foods will become common. Unless refrigeration and good sanitation are scrupulously observed, many of these foods will become contaminated and dangerous for human consumption. Lack of canned foods and shortages of food are bound to lead to a revival of home canning, with the almost inevitable result of cases of botulism.

Every effort must be made to keep food clean; this is no time to stop our insistence that "cleanliness is next to godliness." Our principal safeguards are the elimination of infected food handlers, proper refrigeration of perishable foods, enforcement of public health regulations and constant and efficient laboratory control.

SUMMARY

1. Food poisoning outbreaks are a common occurrence throughout the state.

2. A variety of causes are responsible for these outbreaks.

3. Bacteria are the most frequent cause, the enterotoxic type of staphylococci most commonly implicated.

4. The cases present a typical history and clinical syndrome.

5. Summary of some of the outbreaks in the state during 1942-43 are presented.

6. Foods most commonly concerned in such outbreaks are listed.

7. History of period of incubation at room temperature between preparation and consumption of food is usually noted in toxic types.

8. Rebaking or the addition of substance to inhibit bacterial growth are of value in staphylococcus type.

9. Elimination of infected food handlers, proper preparation and refrigeration of food, and careful sanitation are necessary to prevent outbreaks of food poisoning.

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DISCUSSION

Dr. Waldo L. Treuting (New Orleans): I can add very little to Dr. Hauser's presentation but I would like to stress some of the more important points. First, food poisoning is a very common disease, probably as common as the common cold. Very few individuals go through a lifetime without experiencing one or more outbreaks of this type of illness. The vast majority of outbreaks are small and limited primarily to members of one household. This type does not come to the attention of health authorities and usually is not investigated as to cause. The larger outbreaks involving many people who have attended a public gathering or who have purchased contaminated food from a single place, are reported to the health department and from these statistics the causes are gathered. Bacterial food poisoning, as brought out by Dr. Hauser, is by far the most common and most important type and staphylococcus is the most frequent offender. Isolation of staphylococcus from the suspected food is but presumptive evidence and not proof of its causal relationship. However, since it has been demonstrated that staphylococcus toxin is capable of producing symptoms of food poisoning, the finding of this organism in suspected food is accepted as sufficient evidence for its incrimination.

In the Salmonella or infection type, the next most common type, the proof of causal relationship is more definite. Isolation of Salmonella from excreta and vomitus and detection of agglutinins in the blood is positive proof of causal relationship.

Dr. Hauser mentioned *Bacterium coli* and members of the Proteus group as being the causes of outbreaks. The streptococcus has only been proved recently to cause outbreaks. Possibly there are many other bacteria not at present incriminated that may also cause food poisoning.

It is well worth stressing the types of food usually responsible for outbreaks. Dr. Hauser mentioned meat and meat products, and milk and milk products usually the vehicles in the Salmonella type; milk and milk products, particularly cream, fried pastries such as cream puffs, and salad dressings are most frequently associated with the stayphylococcus type.

From each outbreak a lesson should be learned. Progress has been made in educating food handlers and operators of food handling places. In the education of the general public to the proper handling of food, the surface has not been scratched. This is most important at the present time.

Dr. Clyde Brooks (New Orleans): We are very much indebted to Dr. Hauser for his very interesting paper. However, there is one type of poisoning which he did not mention, which probably occurs more often than we suspect, and that is poisoning by molds such as molded bread. The literature yields numerous instances where poisoning occurred and where there is strong presumptive evidence that the poisoning was due to mold, however there appears to be reluctance on the part of physicians as well as bacteriologists to accept the evidence that molds had caused poisoning. I am inclined to the opinion that molds do cause poisoning and that this reluctance to accept these findings is because there are very few "moldologists" (mycologists) whereas there are many bacteriologists.

Dr. C. C. deGravelles (New Iberia): We are speaking about food poisoning but I want to divert a little from the subject and ask Dr. Hauser a question about a type of poison I think should be

interesting to all of us at the present time. I do not know about the customs in most parts of the country but in my section there has been a custom for many years, among old folks and grandmas, to give a teaspoonful of gunpowder when someone had a fall. Some of them have gotten away from it but there is still some used.

Last Saturday morning I had an urgent call from a man whom they said was dying. I reached there and thought he *was* dying. I stayed with him about five hours and he got all right. I inquired about his illness. He was a man about 58 years old who had had a bad fall and had bruised his back. His mother gave him gunpowder and he became very ill. When I saw him he was in a state of collapse; no pulse, cyanosed, and critically ill. I washed his stomach out and continued to wash it out and in three or four hours he came back and made an uneventful recovery. He said when he came to—"I didn't want to take that gunpowder; it had white spots in it. The kind we used to take was black." I believe if this new gunpowder we're making has this in it we should tell the old aunties and grandmas to keep off of gunpowder. I would like to ask Dr. Hauser about the type of chemical in the new gunpowder.

Dr. John R. Schenken (New Orleans): I would like to ask Dr. Hauser what is the result of the agglutination tests in the Salmonella group. It has been our experience in many cases that these people do not develop any measurable agglutinin titer. I do not know why. The diagnosis in most cases must rest on isolation of organism from food or people ill rather than on presence of agglutinins in the blood.

Dr. George Hauser (in closing): Dr. DeGravelles has discussed a very interesting custom which exists in some parts of Louisiana. For many years gunpowder has been given as a home remedy in case of injuries, apparently with no bad effect until of late. We are all familiar with the old form of gunpowder known as black powder, which when exploded produced a large amount of black smoke, frequently obscuring the aim of the good hunter. This has been superseded to a great extent by the so-called smokeless powders and I believe it is these powders which contain the white spots as mentioned. It is my belief that the black powder contains no nitroglycerine whereas the smokeless powders do, which accounts for the episode of collapse.

Dr. Schenken has asked about the use of agglutination tests in making a diagnosis of Salmonella infection. The value of this method is frequently not satisfactory because: (1) The agglutinin response in infected persons is generally poor and (2) agglutinins to organisms of the Salmonella group are not infrequently found in sera of healthy persons. In patients who have had previous enteric infection or in those who have received typhoid vaccine, the titer is often high. For this reason, if diagnosis is to be made on agglutination tests, it is necessary to secure a sample of blood early in the disease and to repeat the test in about ten days. Unless a considerable increase in titer occurs, no conclusion as to type of infection can be made. The isolation of the organism from the food, feces, vomitus or necropsy material is much more satisfactory and reliable.

I am interested in Dr. Brook's discussion. As he mentioned, molds as a cause of food poisoning have recently received a great deal of attention. The simple presence of mold in food does not mean that it will cause food poisoning as many foods considered a delicacy contain molds of various types. In view of the fact that common molds are frequently found in food or in food which has become contaminated through improper handling, great caution should be exercised before designating molds as the etiologic agent in cases of food poisoning. We have had no cases of food poisoning due to molds. The doctor mentioned certain cases in which animals ate molded food and became ill. There are certain weeds that produce food poisoning in some animals, such as milk poisoning in cattle.

Great care must be exercised in the examination of all cases of food poisoning. Too frequently, superficial, inaccurate or incomplete examination will fail to determine the causative agent. Modern bacteriologic methods must be employed and a thorough search made in an effort to determine the etiologic agent.

Dr. Treuting has emphasized the frequency with which cases of food poisoning occur. It should be kept in mind that certain foods are more likely to be incriminated in food poisoning and also that great care must be exercised in collecting specimens for bacteriologic examination.

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THE PEPPER REPORT

The third Interim Report on "Wartime Health and Education" has just been published by the subcommittee of which Senator Claude Pepper of Florida is chairman. This report is in goodly part factual but at the same time it also makes certain recommendations which are summarized on the basis of the preliminary finding of the Subcommittee of the Committee on Education and Labor of the United States Senate. The recommendations are too long to incorporate in an editorial but they will be printed in the organization section of the Journal. As a matter of fact it would be advisable for every doctor in the state to obtain a copy of this report. Undoubtedly it can be obtained either from one of our two United States Senators or from one of the State Congressmen. Representative Hebert was good enough to send a copy to the office of the Secretary of the State Medical Society.

The reason that the report should be read by members of our profession lies in the fact that there are many data in the report with which medical men are not familiar and that the summarized recommendations which are printed in the Journal are based on the observations and studies of this Committee which are entirely too long to print in detail. Lastly the final recommendation suggests that Federal funds be made available to states for the medical care of recipients of public assistance and in the body of the report discusses how this may be accomplished. This final recommendation suggests to the Editor, if the recommendation is adopted, that it will be the foot in the door which may eventually open wide that door to Federalized medicine. However, this is merely an assumption; as a matter of fact one gets the impression that the Subcommittee is not in favor of a generalized program of medical care for all citizens which would be universal throughout the country.

To substantiate this last statement in the last paragraph it might be noted that the Committee calls attention to the fact that it is the low income group that needs the most medical care—"sickness and poverty go together." The Committee apparently feels that some type of medical care should be provided for the indigent and near indigent, the sixteen million families whose total income is less than $2000 but not for the somewhat over sixteen million families whose income is above this level. They are speaking now of families in the income group and not of individuals nor of the total population of the country. It is estimated that there are slightly over thirty-three million family groups in the country.

The report further says that insurance methods alone will not solve the problem of the indigent because insurance methods are not applicable to the unemployed or to those in the low income group. It notes furthermore in this same paragraph that any method that is offered should include complete medical care. Most of the insurance schemes that are in effect at the present time have to do largely with illness that requires surgical intervention. The Committee states that the medical care should not be cut rate in cost and should permit the free choice of physician or group of physicians and should allow participation in policy by all groups concerned, implying here that the professional group would definitely have representation on whatever Board or Committee or Bureau would have over all charge of the management of the funds that are allotted to the care of the very low income group.

Senator Pepper as well as the other four Senators on this Committee suggest, as their most objective recommendation, the organization of a coordinated hospital service plan. This plan would have, in the sections of the country which are not well supplied with physicians, at least at the onset of the introduction of the plan, a health center in small communities. From this health center would be fed to the nearest "rural hospital," patients who needed hospital care to a limited extent, that is for short illnesses, minor surgery, obstetrics and so on. The next step would be more elaborately equipped hospitals with specialized staffs which would be known as "district hospitals." Here practically every type of medical care would be available to the patient. Patients who present diagnostic problems, who require services of highly specialized specialists and so on would in turn be sent to what is referred to as the "base hospital." The base hospitals should be in large centers and should be units serving the entire state. This hospital should be a teaching hospital equipped for complete diagnostic service where it would be possible to conduct extensive postgraduate work and research. Such a medical center should include also facilities for all types of institutional care and for the care of chronic disease. The Committee obtained their information concerning this set-up from the Surgeon General of the United States Public Health Service.

To a somewhat limited extent in Louisiana, hospital service is provided for the indigent as it is in this coordinated hospital service plan. Some of the smaller state hospitals which have been organized for the last few years are capable of taking care of most all types of illness but many of these patients who present special diagnostic problems or require unusual types of treatment are referred to the two big state hospitals in Shreveport and New Orleans, where the patient may have the benefit of a very much more elaborate equipment, greater laboratory facilities and highly specialized staff which would be impossible for reasons of cost to set up all over the state.

Just a few high points have been touched upon in this report of Senator Pepper. There are many other features which can and will be discussed more fully in the future.

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THE NEW ORLEANS GRADUATE MEDICAL ASSEMBLY

There will be held, Office of Defense Transportation willing, the ninth annual meeting of the New Orleans Graduate Medical Assembly during the week of April ninth. The meeting this year will be necessarily curtailed to scientific presentations alone. There will be no entertainments of any kind and no commercial or scientific exhibits. These restrictions are necessary on account of war-time conditions. The O. D. T. has not granted permission to hold this meeting but as it is purely scientific and is of tremendous importance in the continuing education of many physicians, the members of the Graduate Medical Assembly feel that assent will be forthcoming from the O. D. T.

That the Graduate Medical Assembly has, in its nine years of activity, fulfilled a very

definite need may be judged from the ever increasing size of the meetings. From a relatively small beginning the attendance has increased by leaps and bounds. Not only will there be at the coming meeting a large group of civilian physicians but there will be, as has been in the past three years of war, a large group of medical officers from the armed forces. This type of meeting is particularly valuable for this group because in the services the type of duty is not always one which permits of the diagnosis and treatment of the sick man. That the doctors of the armed forces must keep up their knowledge of medicine is well appreciated by the higher ranking medical officers who have granted leaves for the pupose of attendance at this meeting.

The program this year is fully up to the splendid standards of the past. A group of distinguished physicians will present three or more subjects each in their special fields. To mention a few of the participants in the program it might be said that Dr. F. E. Weidman, Professor of Dermatology, Graduate School of Medicine, University of Pennsylvania, is listed to speak on three subjects, the most important of which and most appropriate would seem to be a presentation on post-war skin diseases. In line with the war effort it might be also noted that Captain Waltman Walters of the Medical Corps, United States Naval Reserve and Professor of Surgery at the University of Minnesota Graduate School, will discuss war injuries in naval and marine personnel. Dr. S. A. Levine of Harvard Medical School, whose book on clinical heart disease is well known to all internists, has four important talks listed which should prove of interest to all physicians. Dr. A. H. Aaron, president of the American Gastroenterological Association, will discourse on pancreatic disease and diseases of the biliary tract. Dr. G. C. Schauffler, of the University of Oregon, has four interesting titles on subjects having to do with gynecology and obstetrics. Dr. R. L. Haden, chief of the Medical Division of the Cleveland Clinic Foundation will talk on his favorite branch of medicine, the various aspects of diseases of the blood. He will conduct a clinico-pathologic conference in conjunction with Dr. R. A. Moore, Professor of Pathology of Washington University School of Medicine. Other distinguished physicians, all of them parenthetically teachers, are down on the program but space precludes the possibility of enumerating the names of these men or their subjects.

It is sincerely to be hoped that this meeting will not be cancelled because very emphatically the officers and members of the Graduate Medical Assembly realize that such meetings are of distinct value to the war effort.

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BENZEDRINE IN OBESITY

Obesity is an interesting physiologic condition which frequently becomes pathologic and which under any circumstances is likely to lead to pathologic complications. The syndrome of hypertension, hyperglycemia and obesity is beginning to receive general recognition. If this syndrome persists for a considerable period of time the hypertension may become irreversible and even diabetes may develop. There are a host of other complications but certainly that of the concomitant hypertension is the one that is most productive of associated vascular changes which definitely shorten life to such an extent that life insurance companies are not likely to accept the individual because mortality tables show that death occurs much earlier in life in the fat person than in the average individual.

A few obese patients may suffer from some type of endocrinopathy such as hypofunction of the thyroid or of the gonads, but these cases are rare. Stout people are fat because they eat more than is needed for their energy requirements. This is due in great part to the fact that obese persons apparently have a lower satiety value for food than the normal person. Their appetite is not satisfied when they have a normal amount of food, so they eat more than the ordinary person. These fat people will disclaim ingesting more than the average amount of food but if they are asked to

keep a dietary diary it will be found that the number of calories they take in is well above their maintenance or energy needs.

In a recent paper Albrecht* points out that it has been observed in the past that benzedrine will cause a decrease in the appetite, it delays the rate of evacuation of the stomach, relaxes the organ and increases pyloric tone.

Largely on the assumption that benzedrine will reduce the appetite he administered the drug to three hundred overweight patients whose ages varied from 21 to 53 years. To these people were given from 10 to 30 milligrams of benzedrine daily in divided doses, never ordering the drug to be taken after four in the afternoon. There were no dietary restrictions. When the optimal weight had been reached the patients were then put on a low caloric diet. In 88 per cent of patients there occurred a loss of appetite, in only 12 per cent was the appetite increased. There were a few other symptoms, including increased psychomotor activity in 48 per cent of cases. Dryness of the mouth was observed in some 56 per cent of people. Strange to say insomnia was noted in only 4 per cent.

The usual precautions were taken in prescribing the drug. Individuals with well marked hypertension, for example, did not receive it. It is interesting that 26 per cent of the people showed a gradual fall in the blood pressure as their weight diminished, 40 per cent showed little or no change and 30 per cent had an increase of 8 mm. of mercury systolic.

The author suggests that benzedrine sulfate may be a valuable adjunct in the management of patients who are overweight but always under the supervision of a physician. After they have obtained normal weight their caloric intake may be materially reduced and they may go for long periods of time without gaining weight as long as they remain on the diet. Usually it is found that they can adjust their abnormal appetite at a new level and may not have to resort to the drug, at least for many weeks.

*Albrecht, F. K.: The use of benzedrine sulfate in obesity, Ann. Int. Med., 21:983, 1944.

ORGANIZATION SECTION

The Executive Committee dedicates this page to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

THE PEPPER REPORT

The following are the eight recommendations made by the Subcommittee on Wartime Health and Education, Senator Claude Pepper of Florida as chairman, and released for publication on January 15:

"1. Recommends that Federal grants-in-aid to States be authorized now to assist in post-war construction of hospitals, medical centers, and health centers, in accordance with integrated State plans approved by the United States Public Health Service.

"2. Recommends that Federal loans and grants be made available to assist in post-war provision of urban sewerage and water facilities, rural sanitation and water facilities, and milk pasteurization plants, in communities or areas where such facilities are lacking or inadequate.

"3. Urges State and local governments to establish full-time local public health departments in all communities as soon as the needed personnel become available. With this aim in view, consideration should be given to rearrangement and consolidation of local health jurisdictions and to amalgamation of existing full- and part-time local health departments with overlapping functions. The Federal Government should increase the amount of its grants to State health departments to the end that complete geographic coverage by full-time local health departments may be achieved and that State and local public

health programs may be expanded in accordance with needs.

"4. Recommends that the Army consider the feasibility and advisability of expanding its program for induction and rehabilitation of men rejected because of physical and mental defects.

"5. Recommends that the medical records of the Selective Service System be preserved and that funds be appropriated for further processing and study of these records.

"6. Reports the acute shortage of personnel with training in psychology and psychiatry and the need for immediate steps to increase the output of such personnel with a view to providing child-guidance and mental hygiene clinics on a far wider scale.

"7. Recommends that Federal scholarships or loans be made available to assist qualified students desiring medical and dental education; urges that increased enrollment of women in medical and dental schools, and premedical and predental courses, be encouraged in every way possible.

"8. Recommends that Federal funds be made available to States for medical care of all recipients of public assistance and that allotment formulas governing distribution of Federal funds to State public assistance programs be made more flexible in order to give more aid to States where needs are greatest."

We should look with seriousness upon the last recommendation made by the Pepper Committee, as it provides for Federal control over some forms of medical service. (See editorial on page 370.)

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COUNCIL ON MEDICAL SERVICE AND PUBLIC RELATIONS

You should also be advised that recently the Council on Medical Service and Public Relations of the American Medical Association at a meeting in Washington sent out a statement for publicity prepared by Dr. Louis H. Bauer, member of the Board of Trustees and member of the Council on Medical Service and Public Relations. Their seven recommendations concerning the attitude of the medical profession toward providing adequate medical service are as follows:

"1. Continued expansion of the practice of medicine with full development of approved voluntary hospital, medical, indemnity, industrial and commercial insurance against the costs of medical care.

"2. Development of public health facilities for preventive medicine all over the country.

"3. Development of adequate diagnostic facilities everywhere.

"4. The use of the voluntary insurance principle in caring for the indigent and medically indigent.

"5. The development of hospital facilities where present facilities are used to the utmost and are still inadequate.

"6. The use of Federal funds to aid communities in public health measures, care of the indigent and construction of necessary hospitals, when local communities are unable to finance the projects, but with retention of local administration.

"7. The creation of a unified Federal Department of Health, as above outlined."

It is interesting to note that the above two sets of recommendations come from entirely different sources, one from the Congress of the United States and the other representing a group working on similar objectives. There is not a great variance in some of their deductions and conclusions. It does seem that it will be possible that there could be developed adequate plans to meet the requirements of all.

In addition to making these recommendations, the Council also states that they have authorized the appointment of a "Director of Insurance to correlate and coordinate existing plans and assist in developing new ones so that the whole country may be covered by available insurance plans." This innovation is something that has been sorely needed by the various states in correlating the various medical insurance plans to fit the exact needs of their respective states. We will thus have the oppor-

tunity of having presented to us in a concise form some valuable help in reaching our conclusions concerning these important features of medical service.

In keeping with the above you should know that we have in this state a very active and energetic committee giving serious consideration to bringing in some recommendation to our House of Delegates concerning voluntary prepayment medical insurance. Also there is a committee in the state working on some plans for a solution of improving the physical fitness of the youths of our state.

It is rather interesting to observe why so much emphasis is placed on inadequate medical service being the cause of all of our physical and mental defects, when the basic factors which regulate and provide good healthy bodies have been denied the people. Medical service is only one of the many links in the chain for the strength and health of our people. Therefore, the ideal results can only be accomplished when all of the factors are properly coordinated and each given a positive phase. Our health can only be as strong as the weakest link. True, it is the old saying that disease and poverty go hand in hand, but why try to remedy only the disease when we permit the continuance of poverty and basic factors for bad health. We must, therefore, not be deluded into a sense of security. The 78th Congress completed their sessions without ever having brought the famous Wagner-Murray-Dingell bill, Senate No. 1161 for hearing even before a committee. It was evidently realized that such a drastic change in the distribution of medicine and benefits under this amendment could not be passed. In the December 23 issue of the American Medical Association Journal attention is drawn to the fact that Representative John D. Dingell, Democrat, of Michigan, co-author of this amendment in the House, had given out a statement that he proposes "to salvage portions of the project he proposes that the big bill be split into several sections to be submitted to the new Congress opening in January." He furthermore states that he considers some form of public health and hospitalization insurance with wage earners helping to pay for it should be made a law, but he is against *socialization of medicine.* In keeping with this it is very interesting to note that just last week a bill was introduced by Representative Dingell, H. R. Bill 395, which "proposes to create a Unified National Social Insurance System to provide, among other things, temporary and permanent disability benefits and medical and hospitalization insurance benefits. The medical provisions of this bill are identical with those contained in the Wagner-Murray-Dingell bill introduced in the 78th Congress."

So again the medical profession is called upon to be ever diligent, for it does seem that it is the intention of some of these so-called social minded people to set upon the shoulders of the American public, contrary to their wishes, this nefarious project.

ANNUAL STATE MEETING

Owing to the recent ruling of the Office of Defense Transportation, it was necessary for our organization to make application to them for the privilege of holding our annual meeting on April 13. We have reason to believe that this application will be favored. However, it may be that the Office of Defense Transportation might order us to call off the meeting entirely. Just as soon as we get some positive information you will be informed through the pages of the Journal.

TRANSACTIONS OF ORLEANS PARISH MEDICAL SOCIETY

February 1. Clinico-pathologic conference, Touro Infirmary, 12:00 noon.
Executive Committee, Baptist Hospital, 8 p. m.

February 5. Board of Directors, Orleans Parish Medical Society, 8 p. m.

February 6. Eye, Ear, Nose and Throat Staff, 8 p. m.

February 7. Mercy Hospital Staff, 8 p. m.
February 12. Scientific Meeting, Orleans Parish Medical Society, 8 p. m.
February 14. Woman's Auxiliary, Orleans Parish Medical Society, Orleans Club, 3 p. m.
Clinico-pathologic conference, Marine Hospital, 7:30 p. m.
Touro Infirmary Staff, 8 p. m.
February 15. Clinico-pathologic conference, Touro Infirmary, 12:00 noon.
February 16. I. C. R. R. Hospital Staff, 12:30 p. m.
February 19. Hotel Dieu Staff, 8 p. m.
February 20. Charity Hospital Medical Staff, 8 p. m.
February 21. Charity Hospital Surgical Staff, 8 p. m.
February 22. DePaul Sanitarium Staff, 8 p. m.
February 23. New Orleans Hospital Dispensary for Women and Children Staff, 8 p. m.
February 27. Baptist Hospital Staff, 8 p. m.
February 28. French Hospital Staff, 8 p. m.
Clinico-pathologic conference, Marine Hospital, 7:30 p. m.

NEWS ITEMS

The Southwest Allergy Forum will hold its annual meeting at the Jung Hotel on April 9-10.

Dr. Robert F. Sharp and Dr. William B. Clark appeared on the program of the South Mississippi Medical Society at a meeting in Hattiesburg, December 14. Dr. Sharp spoke on "Significant Urological Symptoms in Pediatrics," and Dr. Clark on "The Management of Some Common Eye Problems."

Major George M. Haik has recently been elected to fellowship in the American College of Surgeons. He writes that the 64th General Hospital, to which he is attached, is now the ophthalmic center for Northern Italy.

Dr. Samuel B. Nadler has been elected to membership in the American College of Physicians.

Major John Herring is serving as a flight surgeon in the China-India-Burma Theater.

Dr. Gretchen M. V. Squires has been certified by the American Board of Pathology.

Dr. John M. Whitney spoke at the Mid-City Kiwanis Club on Public Health Service in New Orleans.

At a recent meeting of the Southern Medical Association in St. Louis Dr. Grace Goldsmith was elected chairman of the Section on Medicine.

At a meeting of the War-Time Graduate Medical Education held at the Camp Plauche Hospital December 27, Drs. Donovan Browne and Urban Maes spoke on bleeding peptic ulcer, and Dr. Frederick F. Boyce spoke on diseases of the liver and the role of the liver in surgery. The committee for the meetings consists of Dr. Howard Mahorner, chairman, and Drs. Urban Maes and Edgar Hull.

LOUISIANA STATE MEDICAL SOCIETY NEWS

CALENDAR

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

EAST BATON ROUGE MEDICAL SOCIETY

At a recent meeting of the East Baton Rouge Parish Medical Society the following officers were elected for the year 1945: President, Dr. Felix Boizelle; Vice-President, Dr. W. R. Eidson; Secretary-Treasurer, Dr. C. H. Voss; Delegates, Drs. T. J. McHugh, H. Guy Riche, A. D. Long, U. S. Hargrove, and H. C. Hatcher; Alternates, Drs. J. A. Durand, J. D. Martin, J. E. Toups, J. O. Hoth, and E. G. Cailleteau; all of Baton Rouge.

VERNON PARISH MEDICAL SOCIETY

At a recent meeting of the Vernon Parish Medical Society the following officers were elected for the year 1945:

President, Dr. John B. Younger, Kurthwood; Vice-President, Dr. T. A. Hendrick, Leesville; Secretary-Treasurer, Dr. Wm. M. Johnson, Leesville; Delegate, Dr. M. W. Talbot, Leesville.

TERREBONNE PARISH MEDICAL SOCIETY

The following officers will serve for the year 1945 for the Terrebonne Parish Medical Society: President, Dr. W. A. Ellender; Vice-President, Dr. T. I. St. Martin; Secretary-Treasurer, Dr. S. C. Collins.

FIFTH DISTRICT MEDICAL SOCIETY

The meeting of the Fifth District Medical Society was held in the middle of the month of January at Monroe at the Francis Hotel. Dr. W. A. Rodgers of Bastrop was elected president to succeed Dr. D. T. Milam of Monroe. Dr. J. E. McConnell of Monroe was re-elected as secretary-treasurer, and Dr. W. L. Bendel was elected as alternate delegate.

The scientific meeting following the dinner was participated in by Dr. E. E. Barlow of Wilmot, Arkansas, Dr. E. L. King of New Orleans who spoke on the "Toxemias of Pregnancy," and Dr. J. H. Musser of New Orleans who spoke on "Viral Pneumonia."

REGIONAL MEETING OF THE AMERICAN COLLEGE OF PHYSICIANS

There was held at the Hotel Peabody, Memphis, January 25-26, a regional meeting of the American College of Physicians in which the membership of the states of Louisiana, Mississippi, Tennessee, Arkansas and eastern Texas took part. Dr. Edgar Hull, the College Governor for Louisiana, presided at one of the sessions and also presented a paper on bacterial endocarditis.

SOUTHERN BAPTIST HOSPITAL

The regular clinical staff meeting of the Southern Baptist Hospital was held on December 16 at 8 p. m. After a short discussion by Dr. W. H. Gillentine of the deaths that occurred in the institution, refreshments were served.

CHARITY HOSPITAL

A meeting of the Medical Division of the Charity Hospital Visiting Staff was held on Tuesday, January 16 at 8 p. m. in the auditorium of the hospital. The following program was presented: Periarteritis Nodosa by Drs. J. S. LaDue and E. Mendal; Early Immunization Against Pertussis by Dr. W. Sako. A case of alcoholism, with peripheral neuritis and other evidences of vitamin deficiency, syphilis and a gastric ulcer which has been under observation by Drs. Goldsmith and Musser for some years, was presented by Dr. S. W. Westfall.

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

The Southern section met on January 12, 1945, at 8:00 p. m. in the Richardson Memorial Building, on the Tulane campus. The following program was presented:

1. A Comparison of Simultaneous Records of Changes in Serum Glucose, Serum Potassium and Blood Pressure after Epinephrine. Foster N. Martin, Jr. (Introduced by Dr. Ralph S. Smith), Department of Pharmacology, Tulane Medical School.

2. The Effect of 2-Methyl-Amino-Heptone on Dogs under Cyclopropane Anesthesia. John Adriani and E. C. Heringman (by invitation), Department of Surgery, L. S. U. School of Medicine.

3. On the Chemotherapy of Tuberculous Infections. Clyde Brooks, Department of Pharmacology and Experimental Therapeutics, L. S. U. School of Medicine.

4. The Effect of Heart Cycle Length on the T Wave of the Electrocardiogram. Richard Ashman, Frederick P. Ferguson (by invitation), Alice Ingraham Gremillion (by invitation), and Edwin Byer (by invitation), Department of Physiology, L. S. U. School of Medicine.

5. Rheumatic Carditis in Association with the Wolff-Parkinson-White Syndrome. Richard Ashman, J. P. Melvin (by invitation) and Ross C. Tilbury (by invitation), Departments of Physiology and Pediatrics, L. S. U. School of Medicine and The Charity Hospital of Louisiana at New Orleans.

6. Diffusion of Water through Dead Plantar, Palmar and Torsal Skin and through Toe Nails of Man. George E. Burch and Travis Winsor (by invitation), Department of Medicine, Tulane Medical School.

7. Use of the Phlebomanometer, Establishment of Normal Values, and a Study of Certain Clinical Aspects of Venous Hypertension in Man. Travis Winsor (by invitation) and George E. Burch, Department of Medicine, Tulane Medical School.

TOURO INFIRMARY

The annual meeting of the Medical Staff was held on Wednesday, January 10 at 8 p. m. The scientific program consisted of a clinico-pathologic conference, a clinical discussion of which was led by Dr. Sydney Jacobs. Following this Dr. D. N. Silverman presented a paper on peptic ulcer complicating dysentery. Following the scientific session the annual election to the Executive Committee of two representatives from the staff at large was conducted. Dr. B. B. Weinstein and Dr. J. D. Russ were the selections of the staff.

CONGRESS ON INDUSTRIAL HEALTH

The Council on Industrial Health of the American Medical Association regrets to announce that the Seventh Annual Congress on Industrial Health,

scheduled to convene February 13-15, will not be held.

This action is taken in compliance with a request received from the Office of Defense Transportation.

The Annual Congress on Medical Education and Licensure has been called off on account of difficulties in transportation. This meeting was scheduled to be held in Chicago at the Palmer House on February 12 and 13.

SPRING REFRESHER COURSE IN OTOLARYNGOLOGY

The fifth semi-annual refresher course in laryngology, rhinology and otology will be conducted by the University of Illinois, College of Medicine at the College in Chicago, March 26 to 31 inclusive, 1945. While the course will be largely didactic, some clinical instruction will be included. This course is intended primarily for ear, nose and throat specialists. As the registration is limited to thirty, applications will be considered in the order in which they are received. The fee is $50. When writing for application please give details concerning school and year of graduation, and past training and experience. Address—Dr. A. R. Hollender, Chairman, Refresher Course Committee, Department of Otolaryngology, University of Illinois, College of Medicine, 1853 West Polk St., Chicago 12, Illinois.

DOCTORS FOR THE NAVY

The serious need for physicians in the U. S. Naval Reserve is emphasized in recent communications from the Bureau of Naval Personnel of the Navy Department. Since the Army discontinued the commissioning of physicians, it was anticipated that the procurement of physicians by the Navy would be increased. Actually the number of physicians commissioned in the U. S. Naval Reserve has been decreasing. Three thousand physicians are needed as soon as possible to ease the emergency which now exists. Even this number will not actually satisfy the demand.

Louisiana has already contributed more than its share of physicians to the various services, but it is necessary to secure every physician who is not absolutely essential to the health and welfare of your state.

Many physical defects may be waived for commission in the U. S. Navy Medical Corps Reserve. This is being done in order to help fill the urgent need of medical officers. The age limit is now 55. Doctors up to the age of 60 may apply for commission and be assigned to the U. S. Veterans Administration. Rank is based on both age and experience.

Any applicant should consult the State Chairman of Procurement and Assignment Service for Physicians regarding his possible release and then contact the Director of Naval Officer Procurement, 611 Gravier St., New Orleans, La.

THE CRITICAL NURSE SHORTAGE

"Our battle casualties are mounting daily," Major General Norman T. Kirk, The Surgeon General, stated at Mayor La Guardia's Nurse Recruiting Meeting in New York City, on January 4. "Not only has this increased the nursing problem overseas," he continued, "but it increases the problem of taking care of those casualties who are being returned from overseas.

"Last month over thirty thousand wounded and sick were returned to the United States by airplane and hospital ship. We expect that this number will be even greater this month. These men all need nursing care. We had foreseen this emergency. Since last October the Army Medical Department has been stressing the need for 10,000 additional nurses. We sent a personal appeal to each one of the 27,000 nurses that the War Manpower Commission told us were available for duty. Our returns from that appeal were pitiful. We received 760 answers and signed up 227 nurses from that group.

"This same shortage of nurses is evident in the Zone of the Interior. On January 2 Percy Jones General Hospital had 3699 hospital and convalescent patients. There were 85 army nurses there to take care of them. That is a ratio of 1 nurse to 43 patients. In addition to the army nurses there were 33 civilian nurses, 23 nurse's aids and 36 WAC technicians. Including the civilian nurses, and nurse's aides, the ratio is still 1 to 26.

"The situation has grown so critical that suggestions have been made that the Army draft nurses through Congressional action. It looks as if this will be necessary to meet the immediate demand for nurses."

* * * *

Forty-eight hours later, in his message to Congress, President Roosevelt said, "Since volunteering has not produced the number of nurses required, I urge that the Selective Service Act be amended to provide for the induction of nurses into the armed forces. The need is too pressing to await the outcome of further efforts at recruiting."

INFECTIOUS DISEASES IN LOUISIANA

The morbidity report of the Louisiana State Department of Health showed that for the week ending December 8 there were reported the following diseases in numbers greater than 10, — 29 instances each of unclassified pneumonia and of malaria, 21 of pulmonary tuberculosis, 15 of diphtheria, and 14 of scarlet fever. The diphtheria cases occurred throughout the state, no one parish reporting more than two cases except Orleans with three. The malaria patients were discovered

in Grant and Jefferson Parishes largely. One case of smallpox was reported from Claiborne Parish. In the following week which ended December 16 there were 36 cases of malaria reported, 29 of unclassified pneumonia, 21 of pulmonary tuberculosis, 20 of scarlet fever, and 10 of diphtheria. Calcasieu Parish reported six of the cases of diphtheria. Grant and Jefferson Parishes reported most of the cases of malaria. The following week which closed December 23 malaria led the reportable diseases with 35 cases, followed in order of frequency with 18 of unclassified pneumonia, 17 of pulmonary tuberculosis, 14 each of diphtheria and of mumps, 11 of influenza, and 10 of scarlet fever. This week the diphtheria cases were scattered over the state. Twenty of the malaria patients were reported from Jefferson Parish. The week ending December 30, in which week the total four weeks' report of venereal diseases is given, showed that of these diseases there were in the month 1,014 cases of gonorrhea reported, 844 of syphilis, 27 of chancroid, and 10 of lymphopathia venereum. Of the other diseases non-venereal in nature, pulmonary tuberculosis was next to the fore with 79 cases reported, followed by 27 of malaria, 19 of unclassified pneumonia, 17 of scarlet fever, and 12 of mumps. The malaria cases again came largely from Grant and Jefferson Parishes. The total number of pulmonary tuberculosis cases was rather surprising, as in the previous four weeks exactly the same numbers were reported as were reported for this last week in the year.

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HEALTH OF NEW ORLEANS

The Bureau of the Census, Department of Commerce reported that for the week ending December 16 there were exactly as many deaths in the city as in the previous week. These deaths were divided 110 white, 55 colored, and seven of these were in children under one year of age. The following week the changes were inconsequential. There were three more deaths in the city than in the previous week, these being divided 120 white, 48 colored, with 15 deaths in small children. The figures for the deaths of the city remained remarkably consistent for the last week in the year. There were 161 total deaths, 109 white, 52 colored, and of these total deaths eight were in infants. For the previous year there had been 181 deaths in that particular week. It is interesting to note that in 1943 there were a total of 7,706 deaths. This was a remarkably healthy year, but the year of 1944 there were only 7,493 deaths. This was really a most unusual record as undoubtedly the city for the last year has increased its population. The diminished number of deaths fell about equally between the two races. There were, however, 390 deaths in infants as contrasted with 362 in the year 1943.

There was really a very extraordinary drop in the number of deaths in the first week of the year, there being only 115 citizens of New Orleans dying in this particular week. Seventy-nine of the deaths were in white people and 36 in the colored, and 9 of the deaths were in small children.

MONTHLY STATISTICAL REPORT DECEMBER, 1944

FROM THE NEW ORLEANS DEPARTMENT OF HEALTH

Estimated Population as of July 1, 1944

WHITE	391,000
COLORED	169,000
TOTAL	560,000

Total Deaths, All Causes	729
WHITE	481
COLORED	248
Resident Deaths, All Causes	597
WHITE	400
COLORED	197

DEATH RATES

(Per 1000 per annum for the month)

	All Deaths	Non-residents excluded
WHITE	15.8	12.3
COLORED	17.6	13.9
TOTAL	15.6	12.8

Total Births Recorded	1223
WHITE	784
COLORED	439
Resident Births	953
WHITE	603
COLORED	350

BIRTH RATES

(Per 1000 per annum for the month)

	All Deaths	Non-residents excluded
WHITE	24.1	18.5
COLORED	31.1	24.8
TOTAL	26.2	20.4

DR. GEORGE F. ROELING

(1886-1945)

The many friends of the genial and popular ex-coroner, Dr. George F. Roeling, were dismayed to hear of his sudden death while en route to his office in his automobile on January 12, 1945. Dr. Roeling at the time of his death was city alienist and superintendent of the City Hospital for Mental Diseases. He was active in the Charity Hospital where he was on the visiting staff serving in his specialty of neuropsychiatry.

DR. ROBERT B. STILLE
(1905-1945)

Dr. Robert B. Stille died suddenly of a heart attack in Many, La., on December 26, 1944. Dr. Stille was a graduate of the Tulane School of Medicine, class of 1930. He was a member of the honorary medical fraternity, Alpha Omega Alpha —having been elected to membership in 1929. After graduating from Medical School, Dr. Stille interned at the Charity Hospital in New Orleans from 1930 to 1932 (for two years). In the summer of 1932 Dr. Stille began the practice of his profession in his home town of Many, Louisiana where he was located until his death on December 26, 1944.

In addition to his practice Dr. Stille was a Director of the Sabine State Bank and Trust Company from 1930 until his resignation in April 1944. Dr. Stille was a member of the Sabine Parish Medical Society, of the Louisiana State Medical Society, and of the American Medical Association. He was an active member of the First Baptist Church of Many, Louisiana and took a very active part in all community affairs.

WOMEN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

December News Report

Parish auxiliaries, reconvening during the fall, have directed their activities along various channels. Meeting with groups at their regular monthly meetings, the State Auxiliary president, Mrs. Rhodes Spedale, reports the sponsoring of many noteworthy projects in addition to routine carrying out of the state program.

The Shreveport Blood Bank, to be created and maintained by the Medical Auxiliary in that city, offers a highlight of interest. Acting under the inspiration and direction of the Parish Medical Society, the doctors' wives will have entire charge of the project.

The problems of post-war medicine are being delved into by the far-seeing women of the Ouachita group, who have inaugurated a program which they will be glad to discuss and augment with interested auxiliaries. In addition to the war time phases entered into by busy dostors' wives, the ladies of the Rapides Auxiliary have unobtrusively added a piece of work with a definite post-war future. They have established a circulating library for bedridden patients in one of the hospitals, and collect and distribute the books twice weekly.

Both Mrs. Spedale and the chairman of publicity would welcome the opportunity to publish material of interest to the members at large concerning the activity of each of the eighteen active units. Reports may be addressed either directly to Mrs. Spedale or to 720 Broadway, New Orleans 18, La.

The importance of each Auxiliary partaking actively in the program to impress the public with the menace of the Wagner-Murray-Dingell Bill cannot be too greatly emphasized. All parish auxiliaries are directed that one meeting be devoted to having a doctor, or a member versed on the subject, discuss the injustice this bill would inflict upon the public. Guests should be invited for this meeting in order to reap as much benefit as possible from the effort and time devoted to the topic. Publicity chairmen of the individual groups are urged to secure as much local attention as their ingenuity may devise and to report in full all material to the medical groups with which they are associated.

The selection of our Mrs. A. A. Herold as Constitutional Secretary of the Auxiliary to the American Medical Association seems very natural to those who know her capabilities so well, but is nevertheless an outstanding tribute to the individual and to the organization she has so ably represented. Another transaction of the National Convention which will be of interest to all concerns the amendment of the entire constitution and by-laws of the national group. The revised copy will appear elsewhere in the current issue of the Journal. The discussion concerning the revision was ardent and impetuous, and it behooves each member to study the new document of the parent organization very carefully. Participating in the National Convention were the Louisiana State Auxiliary president, Mrs. Rhodes Spedale, Mrs. A. A. Herold of Shreveport, Mrs. Donovan Browne, Mrs. Roy B. Harrison, and Mrs. Cassius Peacock, all of New Orleans.

In her capacity as Constitutional Secretary for the Women's Auxiliary to the American Medical Association, Mrs. Herold, accompanied by Mrs. Spedale, attended the Conference in Chicago on November 16 and 17. The interesting and enlightening reports from the presidents attending the meeting will be incorporated in messages these ladies will transmit later to various groups.

Mrs. John S. Dunn, 8410 Pontchartrain Boulevard, New Orleans, La., as State Historian asks that the responsible member in each of the parish auxiliaries transmit to the historian material appropriate for the State history book. Mrs. Melton, of Plaquemine, Corresponding Secretary, is anxious to complete her list of officers of the various parish units.

The re-organization of the Second District under the councilorship of Mrs. Roy B. Harrison is noted with enthusiasm and appreciation. The date of the annual session of the society, Friday, April 13, must be given special consideration. According to Dr. Talbot, Secretary-Treasurer of the Louisiana State Medical Society, the executive committee has decided to have only a one day meeting in 1945 instead of the usual four day annual session. The

decision was found necessary owing to war conditions; affecting hotel reservations, accommodations for exhibits, meeting halls and transportation, all of which if arranged for would be subjected to change upon short notice by military necessity.

The president's greeting of "A Victory in the New Year" is a fitting note upon which to close this report.

Respectfully submitted,
(Mrs. Edwin R.) Mazie Adkins Guidry,
Chairman of Press and Publicity.

BOOK REVIEWS

1. *Antimalarial Drugs*: By Owsei Temkin, M. D. and Elizabeth M. Ramsey, M. D. 2. *The Blood Plasma Program*: By James A. Phalen, M. D., Colonel, U. S. Army. 3. *Spontaneous Pneumothorax*: By James J. Waring, M. D. 4. *Keys to the Mosquitoes of the Australasian Region*: By Kenneth L. Knight, Lieutenant, H-V (S), USNR, Richard M. Bohart, Lieutenant (jg), H-V (S), USNR, and George E. Bohart, Lieutenant, H-V (S), USNR. Washington, D. C., National Research Council, 1944.

These are a group of four reports issued by the Office of Medical Information which contain the latest material which has to do with their subject matter. As with any paper issued by the National Research Council, their content may be relied upon as being complete, full, and authoritative.

J. H. MUSSER, M. D.

Surgical Errors and Safeguards: By Max Thorek, M. D., D. C. M., F. I. C. S. 4th ed. Philadelphia, J. B. Lippincott Co., 1943. Pp. 1085 illus. Price $15.00.

This work of Thorek has filled a need in surgical literature as is attested by the fact that this new edition (4th) has been called for. There is little to criticize. The illustrations are excellent. The new chapter on the medical-legal aspects of surgical practice by H. W. Smith is a valuable addition to this revised edition. One might suggest that in future editions of this book more consideration be given to the errors and safeguards concerned with the diagnosis and treatment of injuries of the abdomen and thorax. The book can be highly recommended to younger surgeons.

H. A. DAVIS, M. D.

Textbook of Pathology: By E. T. Bell, M. D. 5th ed. enl. and rev. Philadelphia, Lea & Febiger, 1944. Pp. 862, pl. illus. Price $9.50.

The fourth edition of Dr. E. T. Bell's Textbook of Pathology embodies the same lucidity so characteristic of the earlier editions. The illustrations have been increased from 431 to 448, and two new color plates have been added. The new edition has some 130 less pages than the previous one.

On reading Dr. Bell's Textbook, one is instantly aware of the close and thorough study of the largesse of material available to the author. In so far as 25 per cent of all persons dying in Minneapolis over one year of age come to autopsy, one can readily see the tremendous influence played by the author in making the department a pathological mecca. Fact and fancy are well separated, and conclusions are painstaking and conservative. Because of the enormous accumulated material studied year after year, very little need be "borrowed". One is often pleasantly surprised after spending considerable time in perusing the literature on a certain problem, to go back to this book and find the essentials completely and neatly dealt with in a few concise sentences. It is this attribute of the author to express things simply, lucidly, concisely and authoritatively that makes this textbook outstanding for the student of medicine, whether he be an undergraduate or a graduate.

This brevity may have a few drawbacks especially the newer material in which the reader may wish some added information. The separation of vitamin deficiencies in Chapter 5 in the fourth edition is a distinct advantage to its scattered mention in the previous editions. However, not all of the substances comprising the vitamin B complex are mentioned. It seems since biotin is discussed such substances as pantothenic acid, para-aminobenzoic acid, inositol and folic acid should also be considered. Possibly the coenzymatic function should have been further developed in consideration of thiamine. Choline is discussed as a lipotrophic factor in another chapter.

Retrogressive changes are admirably dealt with. The Virchowian elements so frequently present in many texts are swept aside, as for example the concept of albuminous granules in cloudy swelling. The chapter on inflammation is excellent and embodies the newer concepts of the subject. Under congenital syphilis the author mentions the intralobular cirrhosis present, but the frequency of this in our material emanating from Charity Hospital has not been too impressive. Under leprosy there does not seem to be too clear a distinction between the histological forms. An excellent discussion of Boeck's sarcoid and its relation to Heerford's syndrome is present although no mention of tuberculin anergy is encountered. The section on virus and richettsial diseases is well written.

It would be exceedingly worthwhile for anyone dealing with malignant disease to study this section carefully. There are so many excellent things presented that the reviewer is tempted to comment on all. A few of these will be considered. They

have the ring of aphorisms true and tested. Such statements as "A tumor is as malignant as its most malignant part" is a magnificent fundamental statement, and bears out in clinical practice. To the reviewer, attempting to categorize empiricism and translate this to the patient in forms of distinct grading has been overdone, and in some instances is certainly of doubtful value, and is in conformity with the views of the author. As a corollary postulate to this comes the statement, "making a prognosis or recommending treatment in the clinical and biological characters are often more important than its histologic structure". It would be well for oncologists to hearken to this aphorism.

In the never never land between the normal and malignant the pathologist is tempted to place on it Grade I. The author admonishes where this uncertainty exists grading should not be used. The author stresses one important fact, in which the reviewer is in complete accord, that it is important to recognize Grade I fibrosarcoma. The application of "sarcoma" to the uninitiated surgeon and pathologist usually results in radical procedures. Less radical procedures can be considered here and that has been the reviewer's experience.

In the fundamental concept of neoplasia the newer important work is clearly brought forth. The objections to Cohnheim's hypothesis is timely. The role of chronic inflammation is modified to meet modern conceptions. Under osteogenic sarcoma, he states that a classification based on histological structure is unsatisfactory since several types of tissue are present, and further if the pathologist assumes the responsibility for diagnosis, he should examine the patient, study the roentgen-ray plate and be present at the operation. This is excellent counsel an dshould be taken to heart by pathologists.

The reviewer is in full accord with his comment on the narrowing field of endothelioma and shedding proper light on the nature of Ewing's tumor. The author follows Bailey and Cushing's classification of the gliomata. The illustrations are excellent and clear, especially the astrocytomas, which show the gemistic as well as the stellate variety. Ependymomas might be extended to include the variations. In accord with the author it has been also our experience that the histologic grading of carcinoma of the cervix has little practical value. Late recurrences as long as 10 years following mastectomy have been brought out, which is very valuable information.

The section on diseases of the blood is introduced by a description and colored plates of the cells. Erythroblastosis fetalis and the Rh factor is discussed well. In polycythemia the significance of the Giesbock's syndrome is brought out. Primary splenic neutropenia is discussed. The difficulty in distinguishing aleukemic reticuloendotheliosis from secondary hyperplasia of the reticulum is rightly alluded to.

The section on the liver is well written and emanates from the experience of a large volume of material. Many of the confusing ideas prevalent are "straightened out". The section on the cardiovascular system is well illustrated and written. Recurrent rheumatic endocarditis is emphasized. Acute and chronic cor pulmonale which is not myocarditis is discussed.

Under the chapter of the kidney there is very little one can say that has not been said by many already. It represents a unique and distinct milestone in the understanding of renal disease and should constitute a part of the armamentarium of clinicians and pathologists. Additional descriptions of the kidney in disseminated lupus erythematosis is discussed.

The diseases of the glands of internal secretion are well handled. The author rightly points out that the term Cushing's syndrome is more appropriate than pituitary basophilism and stresses the recent work of Crooke. Under neuropathology the various types of encephalitis are well handled. The chapter on bone has excellent photographs and good discussion. Very little space is given, however, to joints.

Having read the book, one is impressed with the vastness of material presented in a small space. It is a book which is a valuable asset to the clinician as well as the student. It can be recommended very highly.

BJARNE PEARSON, M. D.

PUBLICATIONS RECEIVED

W. B. Saunders Company, Philadelphia and London: Manual of Clinical Mycology, Prepared Under the Auspices of the Division of Medical Sciences of the National Research Council. Clinical Heart Disease, by Samuel A. Levine, M. D., F. A. C. P.

J. B. Lippincott Company, Philadelphia: Medical Uses of Soap, Edited by Morris Fishbein, M. D.

The Williams & Wilkins Company, Baltimore: The Etiology, Diagnosis, and Treatment of Amebiasis, by Charles Franklin Craig, M. D., M. A. (Hon.), F. A. C. S., F. A. C. P., Colonel, U. S. Army, Retired, D. S. M. The Avitaminoses, by Walter H. Eddy, Ph. D. and Gilbert Dalldorf, M. D.

Harvard University Press, Cambridge, Mass.: Familial Susceptibility to Tuberculosis, Its Importance as a Public Health Program, by Ruth Rice Puffer, Dr. P. H.

Lea and Febiger, Philadelphia: The Pathology of Internal Diseases, by William Boyd, D. D., LL.D., M. R. C. P., Ed., F. R. C. P., Lond., Dipl. Psych., F. R. C. S.

Grune and Stratton, Inc., New York: Personal Mental Hygiene, by Dom Thomas V. Moore.

John Wiley and Sons, Inc., New York: Introduction to Parasitology, by Asa C. Chandler, M. S., Ph. D.